The Cotton Gin and Oil Mill

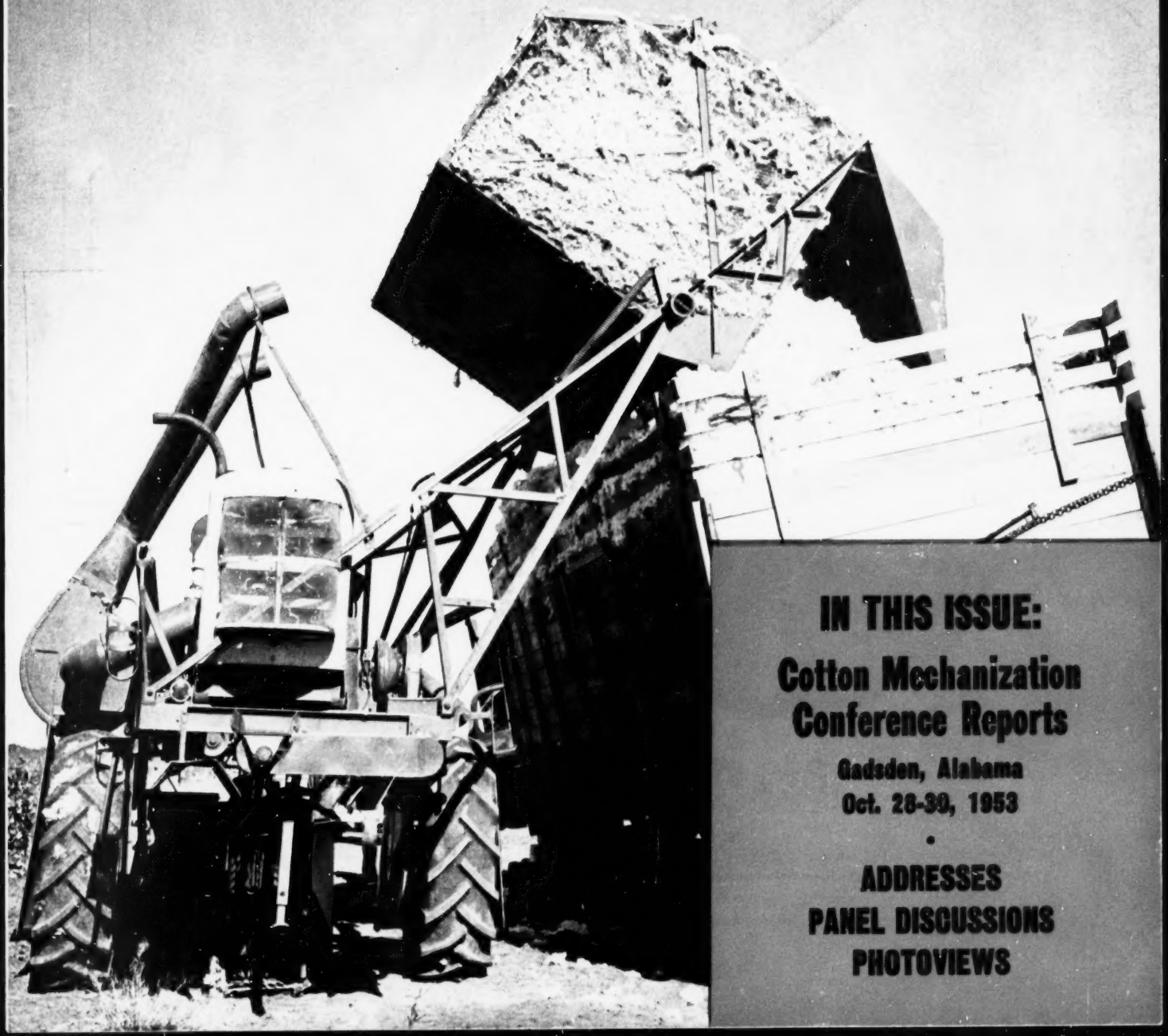
PRESS

NOVEMBER 7, 1953

54th year

THE MAGAZINE OF THE COTTON GINNING AND OILSEED PROCESSING INDUSTRIES

A PROGRESSIVE AND RESPONSIBLE PUBLICATION



IN THIS ISSUE:

Cotton Mechanization Conference Reports

Gadsden, Alabama
Oct. 28-30, 1953

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ADDRESSES
PANEL DISCUSSIONS
PHOTOVIEWS

Solving the Problems of Mechanical Agriculture

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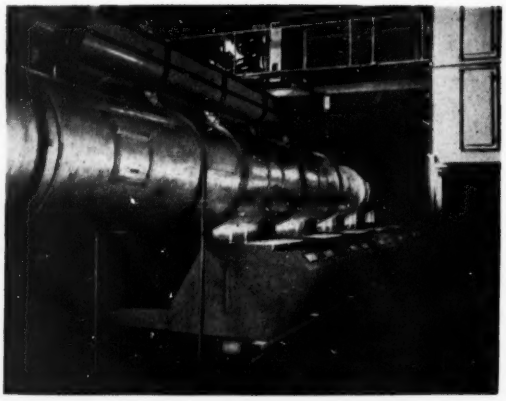

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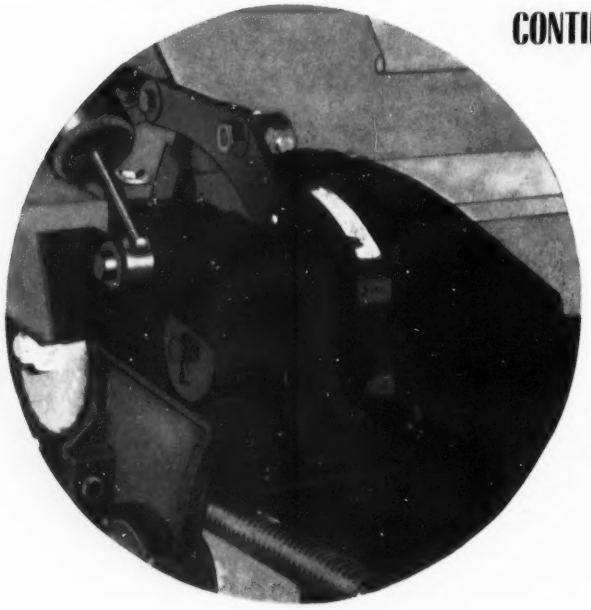

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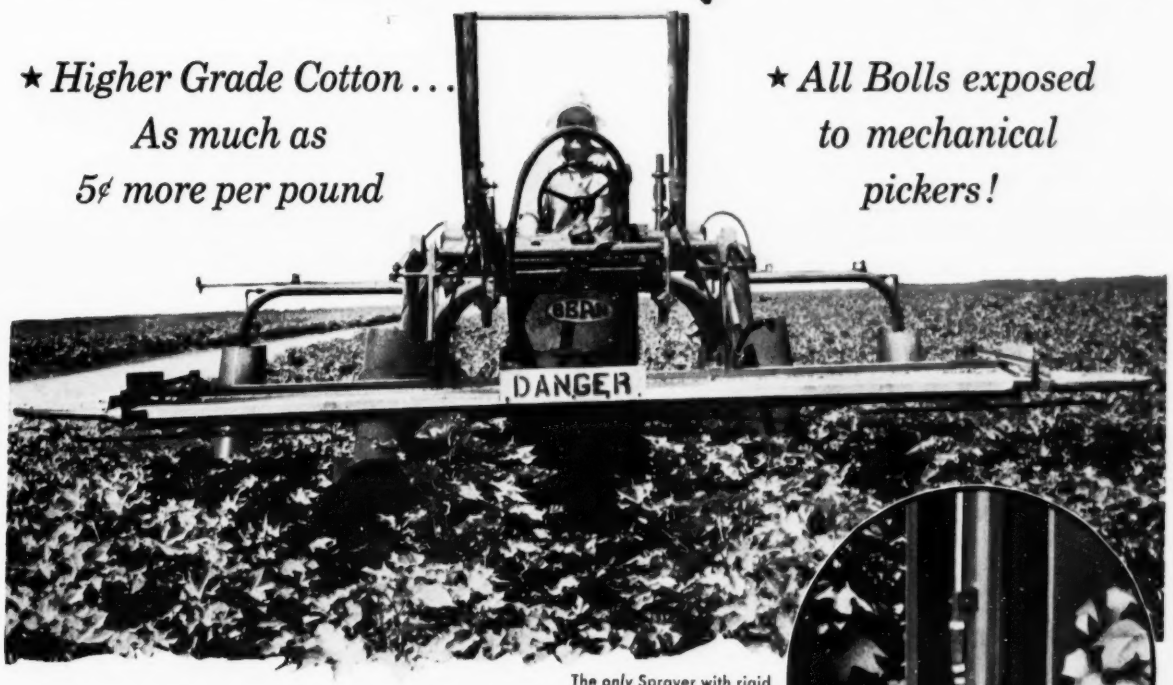

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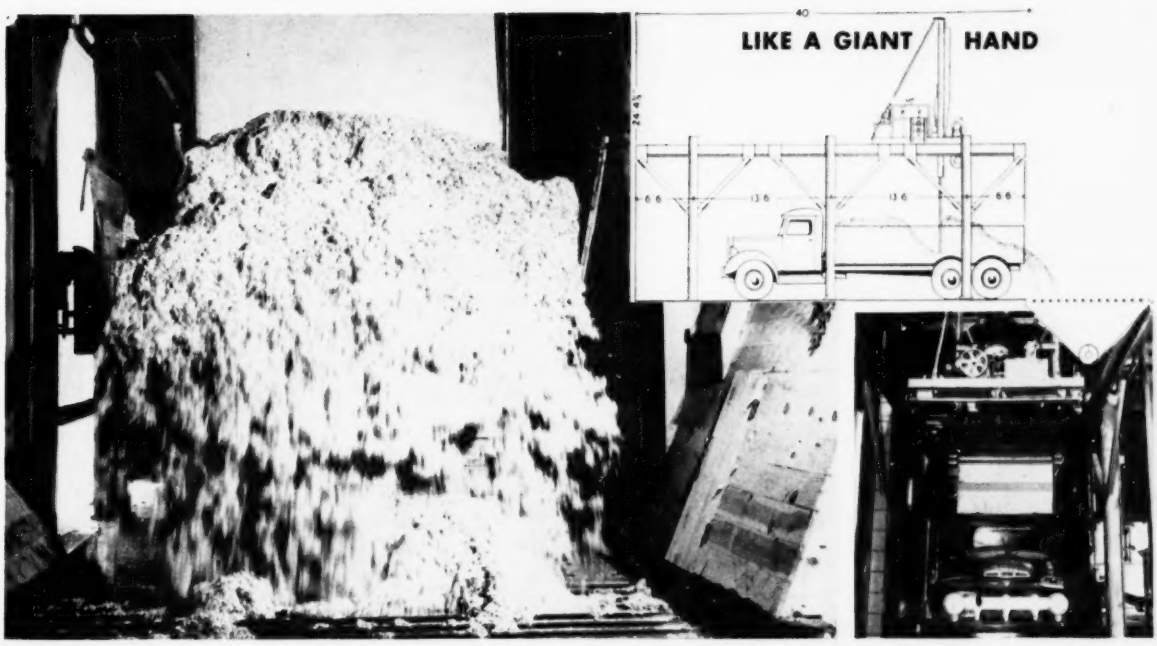

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★ ON OUR COVER

Custom harvesting of cotton by machines is spreading across the Cotton Belt and makes an appropriate cover scene for this issue, which contains the report of the seventh annual Cotton Mechanization Conference held Oct. 28-30 at Gadsden, Ala. The cover picture shows a mechanical harvester dumping cotton into a nine-bale trailer.

Photo by The Cotton Gin and Oil Mill Press

VOL. 54 NOVEMBER 7, 1953 NO. 23

The Cotton Gin and Oil Mill PRESS...

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Tennessee Cotton Ginners' Association

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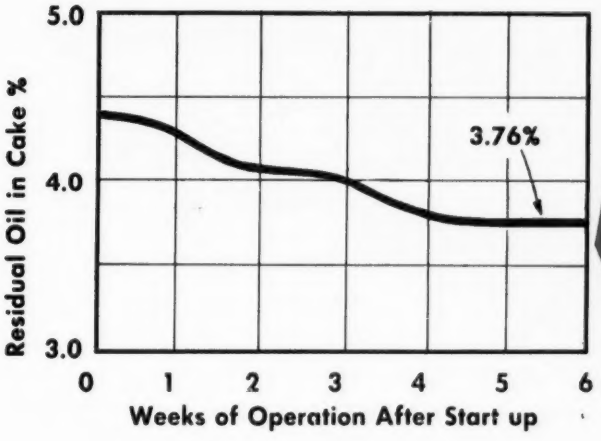

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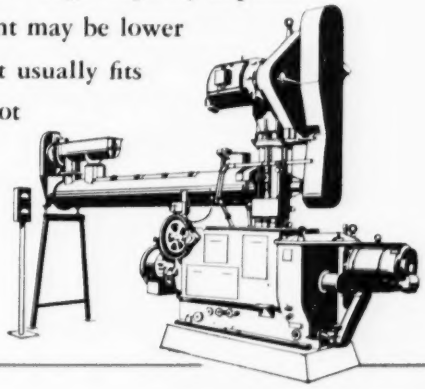

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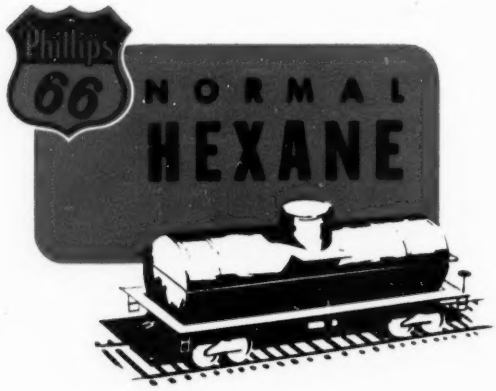

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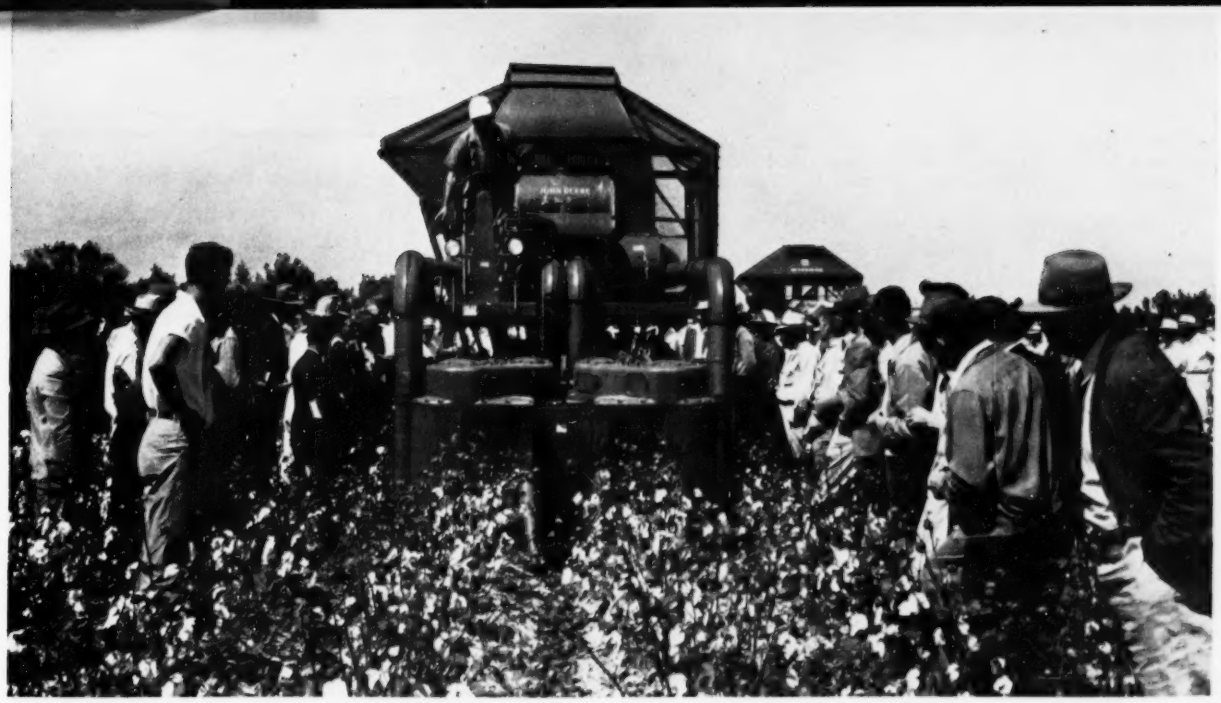

ATTENDANCE at the Beltwide Mechanization Conference at Gadsden, Ala., is only one of many evidences of wide interest in cotton mechanization. This picture, made by E. T. Hollowell, Atlanta, NCPA Educational Service fieldman, shows part of the crowd at the recent Cotton Field Day at Upper Coastal Plains Station, Rocky Mount, N.C.

Mechanization Conference Report

Road Not An Easy One, But

Small-Farm Mechanization Seen As Practical Goal

The Gadsden conference, held Oct. 28-30, was the occasion of our first full-scale appraisal of what needs to be done to bring complete mechanization to cotton's biggest producer — the small farm.

•

By IVAN J. CAMPBELL
Editor, The Cotton Gin and Oil Mill Press

FULL RECOGNITION of the difficulties we face in mechanizing cotton production in the Southeast and other parts of the Old South with their many family-sized small farms was made at the Seventh Annual Beltwide Cotton Mechanization Conference, Oct. 28-29-30, at Gadsden, Ala.

Speakers faced objectively the mechanization problems stemming from the fact that, in 1949, more than 800,000 farms in Alabama, Georgia, Tennessee, Mississippi, Arkansas and Louisiana averaged less than $1,500 income from all farm products.

The Gadsden conference, best attended since the series began, brought into sharp focus for the first time the many problems peculiar to small-farm operation that stand as barriers to general, practical mechanization in those states. Among them:

(1) More than 30 percent of our total cotton production is by growers with 15 acres of cotton or less.

(2) In Alabama, where conditions are fairly typical of the Southeast, 69 percent of the 211,512 farms in the state produce cotton. But the average cotton area on these farms last year was only 10.6 acres per farm, producing an average of 6.1 bales that provided about $1,000 of cotton income.

(3) Most of our small cotton farms are low in power and equipment, but high in people in relation to land.

(4) Heavy, multiple-row equipment is difficult and too expensive to use on most of these farms.

(5) Lighter and more maneuverable machines have been developed, but others are still needed to make mechanization a realizable goal on farms worked principally by family labor.

These and other facts relating directly to the subject of small-farm mechanization are treated in detail in the Conference addresses and panel discussions published in this issue of The Cotton Gin and Oil Mill Press. In addition, most of the machines now in use for cotton production in the Southeast are described in a commentary prepared for the tour and field demonstration Oct. 30 at the Alabama Agricultural Experiment Station's Sand Mountain substation located at Crossville. The commentary will be found elsewhere in this issue.

Over-all, great progress has been made in the agricultural economy of the Southeast but, as one speaker emphasized, the gains have been made, for the most part, on farms that were above average in size and general fertility. In

addition, these farms generally were adaptable to mechanization and to use of livestock as a supplement to cash crops.

The larger number of farmers—and it is with their peculiar problems that the Conference was primarily concerned—are much less favorably situated and are dependent, in most cases, on a single major source of income.

The following statistics help to emphasize those problems: for the Southeast as a whole, the average is 14 acres of cotton per farm, but most farms have even smaller acreages. Ninety percent, for example, harvest less than 25 acres, and 97 percent less than 50 acres.

Actually, it was pointed out, about 40 percent of all farms in the Southeast are still "one-horse" farms. Another 40 percent are part-time or so-called residential farms, many of which are operated with workstock.

The mechanization problem in the Southeast is going to be especially difficult to solve on these "one-horse" family-sized farms. Such farms, experience has taught, simply cannot raise their overall income, and hence their standard of living, appreciably without hiring additional help at peak labor periods or supplementing the family's efforts with tractors and other labor-saving equipment.

As one of the papers in this issue points out, at least two different studies have shown that for general farms in the Southeast, consisting of 30 acres of cropland and operated with family labor, workstock are a cheaper source of power than tractors.

"But on these same farms," it was said, "if family labor cannot handle most of the labor load, then tractor power normally will be cheaper than livestock." And, the author of this same paper predicted, "As we continue, by working together, to take advantage of our opportunities in solving our problems, through mechanization and other technological advancements, the small farm of the future will become a larger farm than the small farm of today."

The natural inclination to follow other sections is a factor that has turned the Southeast toward complete cotton mechanization, but the greatest impetus has come from the fact that labor is diminishing and its cost increasing. New and expanded industry in the South has been a highly successful bidder for farm labor and is expected to deplete further the supply available for farm production.

This competition, one speaker said, has done more to improve Southern agriculture than anything else. And instead of displacing farm labor, he asserted, power machinery has simply replaced it and will continue to do so. "To the farmers who mean business, it is giving independence and the opportunity to make the most of their time."

Several Conference speakers underlined the key position of the ginner in the mechanization picture. The gin machinery manufacturer has provided him with new, improved equipment that does an excellent job of ginning machine stripped and spindle picked cotton. Because of the heavy capital investment required, however, it has not always been easy for the ginner to time plant modernization precisely with the advent of mechanical harvesting in his community. But in those areas where harvest by

(Continued on Page 55)

Little Rock Site for 1954 Conference

ANNOUNCEMENT was made at the final session of the Gadsden conference that the 1954 Beltwide Cotton Mechanization Conference will be held at Little Rock, on July 21-22-23. Sessions will be held at Little Rock and the field demonstration on the nearby farm of National Cotton Council President Harold A. Young.

The conference will stress preharvest operations, with emphasis on supplemental irrigation. Other subjects to be covered include weed control, insect control, land preparation and fertilizer placement.

Mellorine Served at Gadsden Banquet

Mellorine, the frozen dessert made from cottonseed or other vegetable oil, was served to the large crowd attending the annual banquet Oct. 29 at the Cotton Mechanization Conference at Gadsden, Ala. Claude L. Welch of the National Cotton Council told the group something of the history of Mellorine and its present and potential importance as a market for cottonseed oil.

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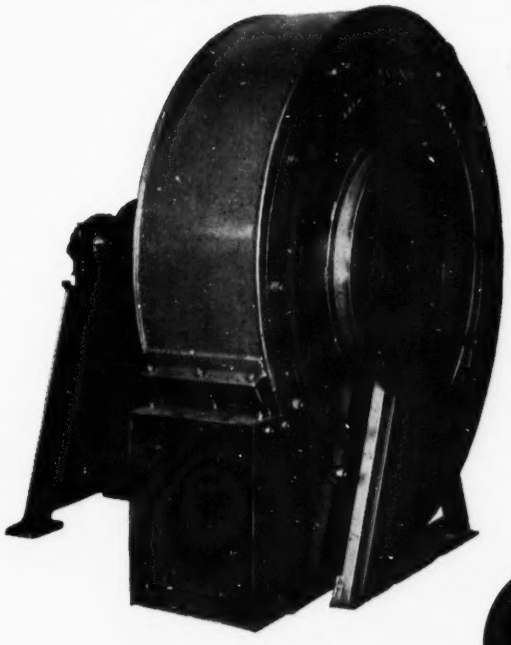

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Mechanization Conference Report

Address of Welcome

By P. O. DAVIS

■ Address of welcome to the delegates, Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

I AM especially pleased that the Extension Service and Experiment Station of the Alabama Polytechnic Institute are teaming with the National Cotton Council and the local people in holding this conference. We want you to enjoy to the fullest your stay here; and to gain the maximum by it.

At the outset I join you in recognition of the fact that cotton is now confronted with big and difficult problems but that each of them can be solved by study, by thought, and by applied intelligence through science, technology, and power.

There are many good reasons why Gadsden is a logical place for this conference. It is surrounded by land that is good for farming and for timber. This land contains also minerals essential to a sound economy with a high standard of living in business, in farming, and in industry.

The climate here is normally comfortable. At times it's a little hot and, occasionally, a bit cold but; on an average, it's pleasant and invigorating.

Rainfall is too much at times and too little at other times, but it averages 52 inches per year. This rainfall supplies farmer needs, and it feeds rivers for power, for industrial water, for navigation, and for other uses. Annual rainfall in the Southeast is the highest in any big area of the U.S. This is a major factor in industrial development; and it bespeaks bigger developments in the future, for land and water are the two primary assets of any area.

While we are blessed with a high rainfall we are sometimes cursed with drouths; and this challenges us to do much more with irrigation of cotton and other crops and pastures.

Gadsden is a prosperous and growing industrial city. Products manufactured here are numerous. Major industries include the Allis-Chalmers plant where all of the company's cotton pickers are manufactured along with other farm equipment.

Agriculture in this area is diversified. Cotton is the leading cash producer. Corn, livestock, and poultry are other major farm products. We are especially proud of our forests.

Last year the Alabama cotton crop had a value of $189,814,000 for lint and seed. This was nearly half of our total farm income. Hogs and cattle were second and third in the order named, followed by poultry, eggs, and dairying. Corn is our first crop in land use other than timber.

In Alabama 69 percent of the state's 211,512 farms produce cotton. The average amount of cotton per farm last year was 10.6 acres. Production averaged 6.1 bales which sold for about $1,000.

In California only six percent of all farmers produce cotton. Last year the average grower in California handled 156 acres of cotton; produced 218 bales, received $35,000 in sales. For Arizona the figures were 403 acres and 571 bales; for Texas 70 acres and 25 bales; for Mississippi 12.4 acres and 10 bales; for Georgia 13 acres and 6.6 bales.

P. O. DAVIS, is Director of the Alabama Agricultural Extension Service, Auburn.

These statistics reveal, in brief, that cotton farms in this area are comparatively small and that the cotton income per farm is low. It is true, also, that these farms are low in power and equipment but high in people in relation to land. Thus we see in these statistics the need for more mechanization of the right kind.

Alabama's 1,580,000 acres in cotton this year are only 41 percent of our peak of 3,833,000 acres in 1911. The South's peak in cotton was 43,683,000 acres in 1926. The South's current crop of 20,844,000 acres is 47.7 percent of that peak.

During the last two decades of agricultural adjustment the acreage of only one crop has been reduced in the South, and that crop is cotton. More acres are now growing tobacco, wheat, peanuts, and rice than in 1933 when adjustment began. But cotton farmers are making about as many bales on half as much land.

These figures are both history and prophesy. In brief, they say that our agriculture, while retaining cotton as a major cash crop, is moving in the direction of more grass and more animals to eat it. This means improving the land as well as the people.

Many industries have either moved into or have been developed in the South. Many more rural people can now have off-farm employment at good wages. Employees in non-agricultural establishments in the 13 Southern states increased from six million to 10 million in 12 years; and the end is not yet in sight.

I have mentioned diversification and industry in relation to cotton because underemployed farm families are still far too common. Many of them live on and operate small farms. They should have our special attention.

Perhaps a majority of the farmers within 100 miles of Gadsden have one to two members per family working in industry; and many of the farmers themselves work part of the year in industry and farm the other part. Some of them live as far as 60 miles from their non-farm work; and travel as much as 120 miles daily five days each week to do this. So you can clearly see the relationship between industry and underemployed farm families in this area.

While with us, you'll see a little of our research in the production of cotton. You'll hear more about it; and you'll see also a number of our farms. You'll see the people and the homes in which they live. You may wonder about them.

Let me remind you that our people produce cotton to buy shoes and clothes, to send their children to school, to pay their doctor bills, and, if they can, to buy automobiles, radios, TV sets, and other things. They are trying to live as good citizens; and to train and inspire their children in the same way.

For generations their ancestors have produced cotton. It has never failed them but, at times, it has caused heartaches, disappointments, and economic distress. Even so, they still believe in cotton and its future. They want to live with it and by it in no small degree. And they want to improve it.

I believe that a major factor in progress and improvement will be the successful mechanization of cotton on the land from soil preparation to the gin; and in making adjustments for mechanization all the way through the ginner to the spinner.

We must be mindful of the fact that cotton mechanization isn't simple. It isn't just a machine of the right size, proper shape, and correct operation.

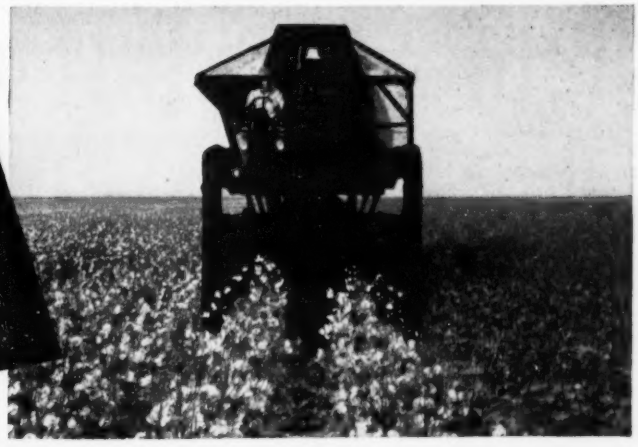
Mechanization of cotton as we see it involves soil preparation, planting, cultivation, irrigation, pest control, harvesting, and handling. It includes also the production of cotton in combination with other crops and livestock, and in conjunction with non-farm work.

On all of this I agree fully with the National City Bank of New York when it says:

"Business depends, in the end, upon the enterprise and ambitions of people; upon their willingness to work in order to raise their standard of living; upon research and technological progress; upon saving and investment; upon good management of public and private affairs; upon cooperation and understanding to maintain fair and equitable terms for the exchange of goods and services; and finally, upon peace, order and stability."

It is in that spirit and with full confidence in you that I again welcome you to this conference and challenge you to get the most out of it for the good of all the people whom we represent and who are depending so heavily upon us.

Place Your Future Cotton Harvests in Gentle Hands



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For many years, the John Deere No. 15 Two-Row Cotton Harvester has been increasing cotton growing profits for Texas and Oklahoma cotton growers.

The clean stripping John Deere saves from $30 to $60 a bale over the cost of hand pullers.

Cotton plants are guided into the stripping units of the No. 15 by the wide, ground-hugging gatherers. The aggressive big-capacity stripper rolls working against the adjustable stripper bars, strip the bolls from the plants, doing a cleaner job than most hand pullers.

As the cotton moves from the stripper rolls to the wagon, it passes over more than 5-1/2 square feet of cleaning area. As a result, you get cleaner cotton, less gross weight, and you pay less in ginning fees.

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Lubbock Will Celebrate Made of Cotton Week

A Maid of Cotton—Made of Cotton Week is being planned for Nov. 16-23 in Lubbock. An extension of the South Plains Maid of Cotton contest, the observance will serve to focus attention on the 21-county area surrounding Lubbock, where much of Texas' and the nation's cotton is grown.

The celebration will emphasize the $225 million circulation that this year's crop is expected to bring to the area, the committee in charge points out. A long-range objective of the festival is to increase consumption of cotton goods.

Activities will include a downtown parade and window displays featuring cotton. The South Plains Maid of Cotton will be selected at the end of the week.

Roy Forkner, Canyon Gin, is chairman of the committee which is planning the event.

Martin Succeeds Trussell In Wesson Division

H. J. Martin has been named division sales manager of Wesson Oil and Snowdrift Sales Co., Houston, succeeding Robert B. Trussell, whose retirement after 37 years of service was announced recently.

Martin has been with the company since his graduation from college except for three years in the Army Air Corps. He transferred from Louisiana to Houston in 1946 and was named assistant sales manager in October 1950.

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• New Mats Will Help Mills Sell Meal

ADVERTISING MATS to help cotton oil mills sell cottonseed meal, cake and hulls through local advertising were mailed Oct. 28 to members of the National Cottonseed Products Association by the Educational Service, 618 Wilson Building, Dallas. The mats can be ordered for 30 cents each, or $2 for a set of eight, plus shipping costs.

"Advertising and public relations cannot be effectively turned off and on as you would use a water faucet," A. L. Ward, Educational Service director, commented in stressing the value of using the advertisements. "Tomorrow's sales are built on today's educational and merchandising efforts."

Slight Increase Noted In Margarine Output

Total margarine production in the period January-September 1953 was 940,876,000 pounds. This is 0.48 percent more than the 936,313,000 pounds produced in the first nine months of 1952.

Production in September 1953 was as follows: colored, 109,582,000 pounds; uncolored, 4,992,000 pounds. In the same month last year colored margarine production was 115,438,000 pounds while uncolored production reached 10,256,000 pounds.

Report on Cotton Ginning

Number of bales of cotton ginned from the growth of 1953 prior to Oct. 18, 1953, and comparative statistics to the corresponding date in 1952 and 1951.

State	Ginning (Running bales linters not included)		
	*1953	1952	1951
U.S.	**8,787,388	**8,563,741	**8,333,691
Alabama	832,427	703,975	757,070
Arizona	247,736	205,085	121,648
Arkansas	833,370	849,136	664,656
California	218,071	382,208	368,826
Florida	13,387	16,032	17,175
Georgia	625,637	586,894	760,074
Illinois	1,107	384	205
Kentucky	4,176	3,069	1,597
Louisiana	483,493	604,974	584,096
Mississippi	1,481,537	1,457,368	1,197,795
Missouri	302,305	242,606	154,271
New Mexico	94,406	112,696	69,119
N.C.	350,786	280,259	309,449
Oklahoma	190,179	149,430	159,431
S.C.	574,613	449,421	646,083
Tennessee	422,027	399,156	280,873
Texas	2,100,140	2,112,121	2,237,176
Virginia	11,991	8,927	4,147

*The 1953 figures include estimates made for cotton gins for which reports were not obtained in time for use in the preparation of this report. Figures on cotton ginnings prior to Oct. 18 were collected by mail and reports were not received for all cotton gins at which cotton had been ginned.

**Includes 345,860 bales of the crop of 1953 ginned prior to Aug. 1 which were counted in the supply for the season of 1952-53, compared with 176,356 and 223,566 bales of the crops of 1952 and 1951.

The statistics in this report include 10,334 bales of American-Egyptian for 1953, 14,219 for 1952 and 5,303 for 1951.

The statistics for 1953 in this report are subject to revision when checked against the individual returns of the ginners being transmitted by mail. The revised total of cotton ginned this season prior to Oct. 1 is 5,549,518 bales.

Consumption, Stocks, Imports and Exports

Cotton consumed during the month of September 1953 amounted to 702,425 bales. Cotton on hand in consuming establishments on Sept. 26, 1953, was 1,296,811 bales and in public storage and at compresses 5,852,917 bales. The number of active consuming cotton spindles for the month was 20,039,000. The total imports for the month of July 1953 were 8,375 bales, and the exports of domestic cotton, excluding linters, were 114,632 bales.

THESE 8 FACTORS CAN HELP MAKE YOUR COTTONSEED CRUSH MORE PROFITABLE

How profitable a crush is depends, of course, on how much it costs you to get oil on the market—and how much more you can sell it for. These are the fundamentals your mill faces, and the real reason for the interest in today's high-yield solvent processes.

Whether you look to this higher or extra yield to enable you to pay more for seed today, or to strengthen your mill for still tougher competitive conditions tomorrow, the following 8 profit supports offered by Lukenweld filtration-extraction may interest you.

Lukenweld filtration-extraction is based on the solvent process demonstrated by the Southern Regional Research Laboratory of the U. S. Department of Agriculture. Standardized "packaged plants," now available commercially in 75, 100, 125 and 150 ton capacities and higher, enable the operator to convert economically to solvent extraction at minimum investment.

1 NO COSTLY PRE-PRESSING—maximum oil yield, formerly requiring a costly pre-pressing operation, is now accomplished via a selected range of cooking conditions, seed rolling and contacting with solvent.

2 98% OIL YIELD—less than 1% residual oil in meal.

3 HIGH MEAL PURITY—minimum free gossypol content, commercially solvent-free meal through Lukenweld's direct-heated hearth-type solvent recoverer.

4 PRIME OIL QUALITY—distillation system design and advanced cooking techniques avoid fixation of color pigments.

5 UP TO 75% LOWER LABOR COSTS—simplified, continuous, automatic operation. Because prepressing is eliminated, a maximum of two operators per shift is required for seed cooking and extraction.

6 LOW SOLVENT LOSSES—maximum of 1% solvent losses through efficient design.

7 MINIMUM INSTALLATION SPACE—compact design requires little space (150 ton plant needs only 20' x 45' x 40' in height).

8 MINIMUM MAINTENANCE AND DOWNTIME—all parts easily accessible, and maximum use is made of standard components.

Lukenweld "Packaged Plants" are available on either a turn-key or cooperative basis. Should the operator desire a turn-key plant, he will receive the benefit of centralized responsibility in engineering, design, specifications, procurement, plant layout and construction—the complete system in operation. Should the operator desire to convert his plant himself, Lukenweld will supply engineering and equipment services and work closely with the operator, or his engineers or contractors.

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Mechanization Conference Report

Response to the Address of Welcome

By CLAUDE L. WELCH

■ Address at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

MAY I SAY simply and sincerely to you, Director Davis, and to each of the hosts for this conference, that we genuinely appreciate your welcome, the sentiment it expresses, and your extensive efforts in arranging to make this conference a pleasant, a comfortable, and a profitable one.

As many of you perhaps know, this is the seventh in the series of annual Cotton Mechanization Conferences. This event, like the six which have preceded it, grew out of the planning of what we call a Beltwide Steering Committee—a committee composed of representatives of the several groups especially interested in the technical and economic progress of cotton production. This includes both private and public research workers, representatives of the farm machinery industry, members of the Extension and Vocational Agriculture staffs, as well as key people from the cotton industry.

As in past years, the program we are about to get started on was not developed with the idea of putting on a machinery show, nor was it developed with the idea of creating a lot of publicity. The central role of these conferences is one of providing a forum—a get-together, if you please—that encourages a free exchange of different points of view, and of new knowledge, and which brings out fresh insights into this broad and challenging aspect of cotton's march forward.

Of course, we have not been unmindful of the constructive purpose that publicity serves in promoting progress in cotton mechanization. In holding these conferences in different parts of the Belt, we have had in mind that this in itself would give helpful publicity to the progress that is being made. But more important, this changing of the locale each year serves as a means of throwing into sharp relief some of the broad obstacles to faster progress in cotton mechanization.

As we get underway with this seventh conference, I have been particularly impressed with the foresight of your steering committee in selecting this site for our 1953 proceedings. Perhaps because of the settings in which previous conferences have been staged, our approach to cotton mechanization problems has tended toward a point of view about like this: We have been primarily concerned with examining the various problems of **substituting** machines and skill for raw human effort. Or, if you please, we have been looking for the development of machines and methods of using

CLAUDE L. WELCH is Director of the Production and Marketing Division, National Cotton Council, Memphis.

them which would do a better job and which were less expensive than human effort.

I am not proposing that these are unimportant problems here in the Southeast, but I would like to suggest and to discuss briefly with you, a subtle additional significance of cotton mechanization. Some of you, I am sure, can recall impressions of the mechanization conference last year out in the San Joaquin Valley of California. There, the characteristically large scale of farming operations—and of about everything else, I am told—makes it easy to reduce cotton mechanization to a rather cold-blooded bookkeeping evaluation. As Director Davis told you, the average farmer in California produces 218 bales, or a gross income from cotton alone of $35,000. And, against that kind of backdrop, it makes real sense to get a sharp pencil and figure how a new machine, a new application of an old machine, or some new technique can reduce the total expenses of operating that cotton farm. But many of the problems which will inject themselves into our proceedings here simply do not come into focus when you look at cotton mechanization in a setting where doing everything in a "big way" just seems to come naturally.

Here in the Southeast, cotton mechanization involves a lot more than the matter of simply finding ways of applying mechanical power which will substitute for undependable labor, or which are less expensive than hand labor. Director Davis was asking you to take a new and searching look at mechanization when he asked: What does it offer the 800,000 farm operators here in the Southeast who produce and sell less than $1,500 worth of farm products a year? And, I think he could also have asked: Why should you even want to mechanize an operation that only produces an average of six bales a year?

The theme of this conference is the problems of cotton mechanization on small farms—and to me that theme has a double-edged meaning. Undoubtedly there are ways that can be found to reduce production expenses and, through that process, leave farmers with a larger net income, even on farms that sell less than $1,500 worth of products during the year. Perhaps mechanization can contribute to reaching such an objective. And undoubtedly, research and education programs which strive toward such an objective are commendable. But I hope that no one came to this conference—and, certainly I hope no one leaves this conference—preoccupied with the notion that the full meaning of mechanization is limited to making more tolerable the small incomes which are an inevitable companion to a small amount of production.

Here, more than at any other mechanization conference, we ought to find an opportunity to look at mechanization's broad, underlying importance—its importance as a supplement to human effort, rather than as a substitute for it. Our goal in mechanization is to make the cotton grower's effort as productive, and thus as well rewarded, as equal effort used in any other part of the Cotton Belt or in any other part of our national economy. While we are examining the problems and the progress in mechanization of small cotton farms, we are likely to miss this larger significance of the march of cotton technology if we keep our sights trained on the statistical target represented by an average production per farm of about six bales of cotton.

I am not proposing that the agriculture of this region re-make itself by a pattern cut to fit some of the large-scale, highly commercialized sections of the Cotton Belt—sections where the progress of mechanization has been more dramatic. And again I emphasize that the role of mechanization in reducing production costs is important. But as we look at the problems of mechanization on small farms, I urge that we keep in mind the broader problem of building a stronger production base under small farms, and that we look upon mechanization as one of the opportunities for building that base.

The essence of technological progress, whether in cotton or in something else, is to bring into a better and more productive balance the various resources which we humans must combine with our energy and skill in producing this world's goods. When we apply that generalization to small cotton farms, are we looking **only** for ways of growing cotton that are **less expensive** — only for mechanical production methods which will make it possible for the average cotton grower to produce his six bales with a smaller cash outlay than he is now spending?

On the small unmechanized farm, the

largest item that goes into producing cotton is the labor of the farmer and his family. One way of explaining the comparatively slow progress of mechanization is that these farmers place such a small value on their labor and that of their families that it actually underbids mechanical energy. Why is such a small value placed on this labor? The classic and essentially sound answer is that there have not been any opportunities to use, or to sell, that labor at a higher value. Thus, it seems to me we are heading up a dead-end street if our vision of mechanization on small cotton farms is confined to searching only for mechanical production methods that call for less cash.

If we are to look beyond opportunities for simply making the "status quo" more comfortable, then perhaps we ought, in fact, to be seriously concerned with developing production methods which in one sense are actually **more expensive.** About any way you choose to look at it, when you start thinking in terms of combining a more suitable and a more productive amount of resources with the labor that is on small cotton farms, you are thinking about a larger monetary outlay. And, isn't this proposition of teaming labor with an adequate amount of capital—capital not only in the form of land, but in the form of more and better equipment, fertilizer, insecticides, and so on—isn't this the broader basis for economic progress wherever you find it?

The tendency to measure the usefulness of cotton production technology only by how much it lowers the cost per pound needs to be re-examined. Let's take a fresh look at that old formula which runs something like this: **Volume** times **Price** minus **Expense** equals **Profit.** This formula, of course, greatly oversimplifies matters but the basic proposition is sound. Production methods which entail **more** expense can nevertheless make sound business sense if the increased expenses actually bring about a larger net income for the farm. It is only in this somewhat idealistic setting, I think—one in which you can visualize increasing the total earning capacity of **farm people** by increasing their producing capacity—that you can find the full significance of small farm mechanization.

• Ginners To Honor Jay C. Stilley

THE NEW BUILDING of the Texas Cotton Ginners' Association will be dedicated to Jay C. Stilley, executive vice-president of the Association, W. D. Watkins, Abilene, chairman of the executive committee, has announced. The building, at 3720-24 Race Street, Dallas, will be completed about Nov. 15.

A plaque will be placed as a cornerstone to the building, dedicating the ginners' headquarters to Stilley in recognition of his activities in behalf of the ginning industry in Texas and the nation. Stilley also is executive vice-president of the National Cotton Ginners' Association, which also will have headquarters in the new building. An architect's drawing and information about the building were published Aug. 1 in The Cotton Gin and Oil Mill Press when the ground was broken for the structure.

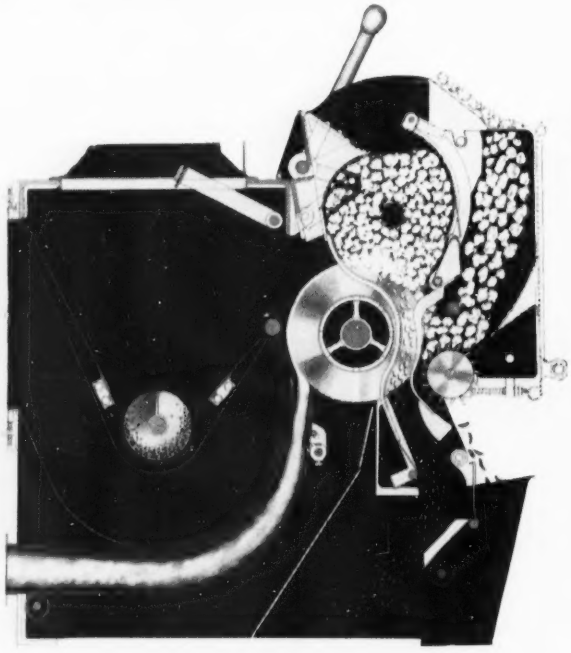
"This building will belong to the ginners of Texas, free and clear of debt," Watkins said, "because sufficient money earmarked for this project has been accumulated in our special fund during the past seven years. Cutting corners when necessary, but never neglecting the needs of our ginners or allied industries' interests has made this possible."

Serving on the building committee have been Lee Massey, Pilot Point; C. L. Walker, Jr., Temple; Walter Evans, Jr., Lorena; Robert Horton, Abilene; Chester Phillips, Greenville; Louis Buice, Waco, and Hop Marshall, Moody. Officers of the Association are S. N. Reed, O'Brien, president; Jerome Jalufka, Violet, vice-president; and Stilley. The executive committee is made up of Watkins; C. L. Walker, Jr., Temple; A. N. Robertson, Hillsboro; Horace Etchison, McAllen; W. O. Fortenberry, Lubbock; Ennis Moss, Roaring Springs; and R. L. Massey, Pilot Point.

Cotton Research Clinic Proceedings Available

Proceedings of the 1953 Cotton Research Clinic have been published by the National Cotton Council and are available without cost to the textile and allied industries. The 125-page book contains the full transcript of all papers given at the two-day meeting held last February in Savannah, Ga., together with charts and illustrations. Copies may be obtained by writing the National Cotton Council, 1832 M Street, N.W., Washington, D.C.

The Council's 1954 Clinic will be held Feb. 17-18-19 at Pinehurst, N.C.



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Mechanization Conference Report

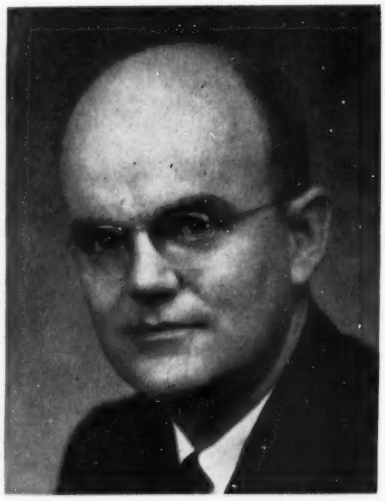
A Realistic Look at Cotton's Future

By Dr. M. K. HORNE, Jr.

■ Address at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

IT IS fortunate that cotton people have learned not to be panicked by short-term adversities. If we should center our attention on some facts of the current situation, we could take a very gloomy view indeed. In the season just past, cotton lost a domestic market for half a million bales in one single use, tire cord. In that same season, U.S. cotton had its worst year on the export market since 1948, and except for '48, the worst peace-time export season in this century. We exported only 3.2 million bales. With a big crop being harvested and the export market showing no conspicuous improvement, the carryover at the end of the current season is being variously estimated at from eight to nine million bales. Today, with prices down and costs still up, the producer faces a sharp cut-back in his volume of operations for the season next ahead. These are hard facts. We have no disposition to shove them under the rug. Cotton people have had an awful lot of experience in facing such facts.

At such a time, it is especially helpful to try to reach with our minds just a few years backward and, so far as possible, a few years forward. If we look across a stretch of years, keeping seriously in mind the word **realistic**, the most fundamental fact that we can **really** see is this: We are living in an unstable and unpredictable world. We can **wish** for an economic world that moves steadily forward in line with somebody's calculations of the annual increase in population and the standard of living; but what we **have** is an economic world that is jerked up and down by wars, rumors of wars, and the business cycle. The underlying trends are only dimly seen at best. The demand for fibers in this jerky world goes up and down by millions of bales per year, mainly because of shifts in inventory policy. The vagaries of the weather increase the problem. To meet that shifting demand, the textile world requires a fiber supply that is resilient, capable of expanding and contracting in line with the market. The synthetic fiber industry, by its very nature, is remarkably inept at supplying any of that resiliency. For a synthetic plant, the normal rate of operation is at 100 percent of capacity; from that normal it has virtually no capacity for short-term expansion, and its fixed costs are so high as to limit severely its capacity for short-term contraction. Likewise the foreign growers of cotton have failed remarkably to supply much of the needed expansion and contraction.



Dr. M. K. HORNE, Jr., is Chief Economist of the National Cotton Council, Memphis.

To illustrate: As we entered the calendar year 1950, there was evidence that fibers were in over-supply. So for the next season, U.S. cotton production was reduced by 6.1 million bales. Did other fiber producers do their share of the curtailing? On the contrary, cotton production elsewhere in the Free World expanded by 1.5 million bales, and world rayon production (from calendar '49 to '50) expanded by the equivalent of nearly 2.0 million bales. (The greater part of this rayon increase seems to have come before, not after, the middle of 1950.) It was soon evident that our own curtailing had been over-done. By the next season, the Korean outbreak had reversed the field altogether, and there was a desperate need for expansion. So U.S. cotton production was increased by 5.2 million bales in one season. How about rayon and foreign cotton? In both cases, the expansion which we got in the year that we needed it so desperately was **less** than the expansion of the previous year when the exact opposite was thought to be needed. And now we face another year in which it is generally assumed that there is over-supply. Again it is anticipated that the whole burden of this curtailment will be absorbed by the U.S. cotton industry. And implicit in it all is a smug assumption that whenever a shortage strikes **again** (as it surely will sometime) the American producer will again come to the rescue of the whole free textile world.

Of the two big textile fibers, cotton and rayon, the U.S. cotton industry supplies little over a third of the average world production, but we supply most if not all of the season-to-season adjustments that are made in an effort to keep supply in equilibrium with demand. As long as this is true, we will face from time to time the kind of carryover prospects that we face today. It is not good for the farmer or for the raw cotton industry to be the shock absorber for the fiber requirements of the whole Free World. But by absorbing so much of this instability, U.S. cotton makes it possible for this whole nation and the entire Free World to be more stable economically, and militarily safer, than they otherwise could be. Our industry supplies an economic cushion and a military buffer which the nation largely takes for granted and appreciates almost none at all. One of my real bases for confidence in the future of U.S. cotton is that the significance of this situation must eventually soak into the consciousness of thinking people throughout our nation. If ever we did begin losing out to the synthetics, and if the world began absorbing the meaning of a U.S. fiber supply as rigid and inflexible as the production patterns of the synthetic plants, the significance of what I am talking about would soak in fast.

It is within this kind of context that we must appraise cotton's adversities of the present season and its prospects for the years ahead. It was only 2½ years ago that this nation was begging for a great increase in cotton production. As recently as June of last year (incredible as it now seems) the economists in NPA and DPA were strongly arguing for tax amortization to induce a further expansion in the rayon capacity of this country on grounds that the total foreseeable supply of cotton and rayon together would leave us in grave danger of a fiber shortage. The scales which weigh the difference between surplus and shortage in our cotton are indeed sensitive. They swing deeply and fast. And in spite of the evidences of surpluses at this present moment, I have the nerve to suggest that over the next decade or so, the larger side of the cotton problem may still be, not how to get the markets, but how to get the production.

As for the market side of the cotton problem, we are now at an exceptionally interesting—I might even say **exciting**—place from which to make some observations. From the beginning of World War II until quite recently, there had never been a time when all of U.S. cotton's most serious competitors at home and abroad were in abundant or superabundant supply. Over a long stretch of years we have known that some part of our market depended on our status as the "residual supplier"—i. e., we supplied the market because our competitor couldn't get the needed production. He supplied all he could, and we supplied the rest. Some part of our export market rested on this situation year after year. So did some part of our domestic market. Even in the recession of 1949, we knew for example that the competitive effect of high-te-

(Continued on Page 62)

CLIMAX blue streak engines

PEAK PERFORMANCE WITH POWER TO SPARE . . . that's the reputation of Climax Blue Streak Engines throughout the cotton gin industry. And to fit your particular requirement, Climax makes five famous models with power ranges from 210 to 460 horse power . . . all designed, engineered and constructed especially for the cotton gin industry.

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• Conference Held on Cottonseed Meal

COTTONSEED CRUSHERS, research workers and others interested in cottonseed processing and the nutritional value of cottonseed meal are meeting at the Southern Regional Research Laboratory, New Orleans, Monday and Tuesday, Nov. 9-10 at the third conference on the quality of cottonseed meal as related to processing.

An article discussing this research program is published elsewhere in this issue.

Speakers include Laboratory Director C. H. Fisher; A. L. Ward, Dallas, director, Educational Service, National Cottonseed Products Association; A. M. Altschul of the Laboratory; J. R. Couch, Texas Experiment Station, College Station; C. L. Morgan, South Carolina Experiment Station, Clemson; N. R. Ellis, USDA, Beltsville, Md.; L. V. Curtin, Buckeye Cotton Oil Co., Cincinnati; H. D. Wallace, Florida Experiment Station; B. W. Heywang, USDA, Glendale, Ariz.; F. H. Thurber of the Laboratory; A. B. Watts, Louisiana Experiment Station; W. A. Pons, Jr., of the Laboratory; Dr. C. M. Lyman, Texas Experiment Station; Miss Edith Jensen of the Laboratory; and L. L. Rusoff and J. B. Frye of the Louisiana Experiment Station.

On Wednesday a committee will meet to prepare a summary and conclusions of the conference, which is sponsored by the Laboratory in cooperation with the NCPA Educational Service.

• Maid's Itinerary Is Announced

THE 1954 Maid of Cotton will visit at least 32 major U.S. and Canadian cities on the North American phase of her international tour, the National Cotton Council has announced.

She will make her first appearances at Miami, Fla., Feb. 1-2. From Florida her tour will carry her to these cities:

Charlotte, N.C., Feb. 8-9; Atlanta, Feb. 11-12; New Orleans, Feb. 15-16; Birmingham, Feb. 18-19; Jackson, Miss., Feb. 22-23; Dallas, Feb. 25-26; San Antonio, March 1-2; Houston and Galveston, March 3-5; El Paso, March 8-9.

Phoenix, Ariz., March 11-12; San Francisco, March 15-16; San Joaquin Valley, March 18-19; Los Angeles, March 22-25; New York, March 25-29.

From New York the Maid will fly to Europe for several stops abroad. Her European itinerary has not yet been announced. Returning to the U.S., she will begin the second half of her U.S. tour with appearances at Philadelphia and Wilmington, Del., April 19-22.

Then come appearances at Boston, April 26-27; Washington, April 28-30; Cleveland, May 3-4; Detroit, May 6-8; Memphis, Cotton Carnival Week, May 10-15; St. Louis, May 20-21; Denver, May 24-25; St. Paul, Minn., May 27-28; Des Moines, Iowa, June 1-2; and Chicago, June 4-5.

From Chicago the Maid will cross the border into Canada for stops at Montreal, June 7-8; Toronto, June 10-11; and Hamilton, June 14-15.

A stop at one city in South Carolina will be added to the Maid's U.S. itinerary before the beginning of her tour in January.

Plains Cotton Classing Committee Meets

A committee of farmers and ginners on the South Plains of Texas has been meeting to discuss cotton classing problems with representatives of the USDA cotton classing offices. Latest meeting of the group was Nov. 4.

Earl B. Hobbs, Hobbs Gin, New Deal; and Logan Sowder, Idalou Co-op Gin, Idalou, are ginner representatives on the committee. A farmer representative has been selected from each South Plains county.

Johnson and Strader Form New Feed Firm in Texas

E. B. Johnson and Ralph C. Strader have announced the formation of the Johnson-Strader Co. with general offices in Farmers Branch, near Dallas. Johnson will continue to operate the E. B. Johnson Co., with the new firm expanding operations in feed ingredients. Strader has previously been associated with Van Waters & Rogers, Inc., and Balfour, Guthrie & Co. in Dallas.

Farm Equipment Industry To Meet in Chicago

The fall meeting of the farm equipment industry will be held Nov. 20 in the Congress Hotel in Chicago. The meeting is sponsored by the power machinery department of the Farm Equipment Institute.

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Williams Milling Co., Sac City, Iowa

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Mechanization Conference Report

The Economics of Small Farm Mechanization

By BEN T. LANHAM, Jr.

■ Address at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

THE SITE of this seventh annual Beltwide Cotton Mechanization Conference is in an area typical of much of the cotton producing Southeast[1] — an area characterized by varied types of soils, topography, and climatic conditions; an area that depends primarily on cotton for its farm income; an area with high tenancy rates and large numbers of part-time and residential farmers; an area of small family-type farms with low volumes of production and consequent low levels of farm income; and an area where full farm mechanization is being retarded due to factors such as these, and to limited capital on farms, and high cost of machinery. It is an area possessed of many farm problems.

I have been asked to discuss one of these problems today—The Economics of Small Farm Mechanization. The central theme of this conference is concerned with the problems of mechanizing small cotton farms. This theme, appropriately selected for a conference at this location, is of tremendous interest to the entire cotton industry. It is of particular interest to those of us who live and work in this area. Cotton is our principal cash crop; it is our No. 1 source of income. And most of our cotton producers operate small farms. Thus, if we are to work on and solve the problems of the majority of the cotton farmers in this area, we must work toward solving the problems of the small farm.

As a basis for our analysis and discussion, we need, I think, to define clearly the problem before us. To do this, we must define at least three terms—or answer three questions: (1) what do we mean by mechanization? (2) What do we mean by the economics of mechanization? and (3) How important are small farms in this area?

• **Mechanization Means**—To most farmers in the Cotton South, and particularly the Southeast, "mechanization" up to this time has meant the substitution of mechanical power (principally tractors) for animal power. Farmers have thought in terms of a farm's being completely mechanized when it reached the stage where tractors replaced all workstock. This displacement normally reduces man labor requirements somewhat, but few farmers have thought in terms of the elimination of ali hand labor as being a prerequisite to complete mechanization. Recent developments in harvesting machinery, weed control methods, and other phases of crop production and harvesting will obviously cause these farmers to change their definition of complete mechanization.

BEN T. LANHAM, Jr., is with the Department of Agricultural Economics, Alabama Polytechnic Institute, Auburn.

The term mechanization, up to this point, also has embodied not only mechanization but also certain technological practices that are often difficult to distinguish from pure mechanization. Some of these are necessary if mechanization is to succeed; others are possible only when mechanical power is available. For example, if cotton is to be harvested successfully by mechanical means, there are certain specific cultural practices that must be followed beginning even prior to planting and including such practices as proper spacing, variety, cultivation, and defoliation. On the other hand, practices such as the use of preemergence sprays, liquid fertilizers, and chemicals for weed control, are possible only when mechanical power is available.

For purposes of this discussion, complete mechanization is defined as a condition where mechanical power has been substituted for animal power, all hand labor has been eliminated, and includes all those advances in technology that have thus far been proved to be both technically and economically feasible when used in conjunction with mechanical power in the production and harvesting of a crop.

• **Will It Pay?** — In thinking of "the economics of mechanization," or of any other technological change or farm practice, we should think in terms of "Will it pay?" As a practical businessman, the farmer solves all economic problems by the decisions he makes on a cost-return-profits basis. He is now, and always has been, interested in finding out under his own farm conditions whether a given technological change or practice, if adopted, would be profitable or more profitable than what he is already doing or what he might do under another alternative.

Since returns (or market prices) are largely beyond the control of the individual farmer, he is most concerned about costs and alternatives as factors affecting his profits. These two factors will determine both the decisions that he makes and the rate at which he will make changes and adjustments. Proving the technical feasibility of any new or improved method, practice, or development is no guarantee whatever as to its economic feasibility. And even after the economic feasibility has been established, history would indicate that many, in fact most, farmers will be quite slow in making full and efficient adoption of new or improved practices. This has been particularly true of cotton mechanization and related developments. Complete mechanization of cotton is rather complex, particularly in the eyes of the average farmer—and it should be. For he is always concerned with attaining and maintaining that combination of production factors that will produce for him an efficient and profitable unit. A major factor affecting the efficiency and profitableness of his farm business is its size.

• **The Small Farm**—The term, "small farm," probably has a somewhat different meaning for each of us in attendance at this meeting. Our individual ideas as to what constitutes a small farm are based on a number of factors. Thinking in terms of mechanization we need to consider the number of farms in the area, and their distribution by size groups.

In this area of the Cotton Belt—the Southeast — there are more than two million farms. More than a third of these farms have less than 30 acres of land, and more than half have less than 50 acres of land. Three-fourths have less than 75 acres. The land use pattern of the area indicates that about a third of all farm land is cropland. From the standpoint of the economics of mechanization, therefore, we can look for an average of less than 25 acres of cropland on three-fourths of the farms in the Southeast.

Based on the 1950 Census of Agriculture, 87 percent of the farms in the Southeast have less than 50 acres of harvested cropland per farm. Only four percent have 100 acres or more. These data point to the obvious conclusion that, regardless of what measure of

(Continued on Page 74)

[1] For purposes of this discussion, the Southeast includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

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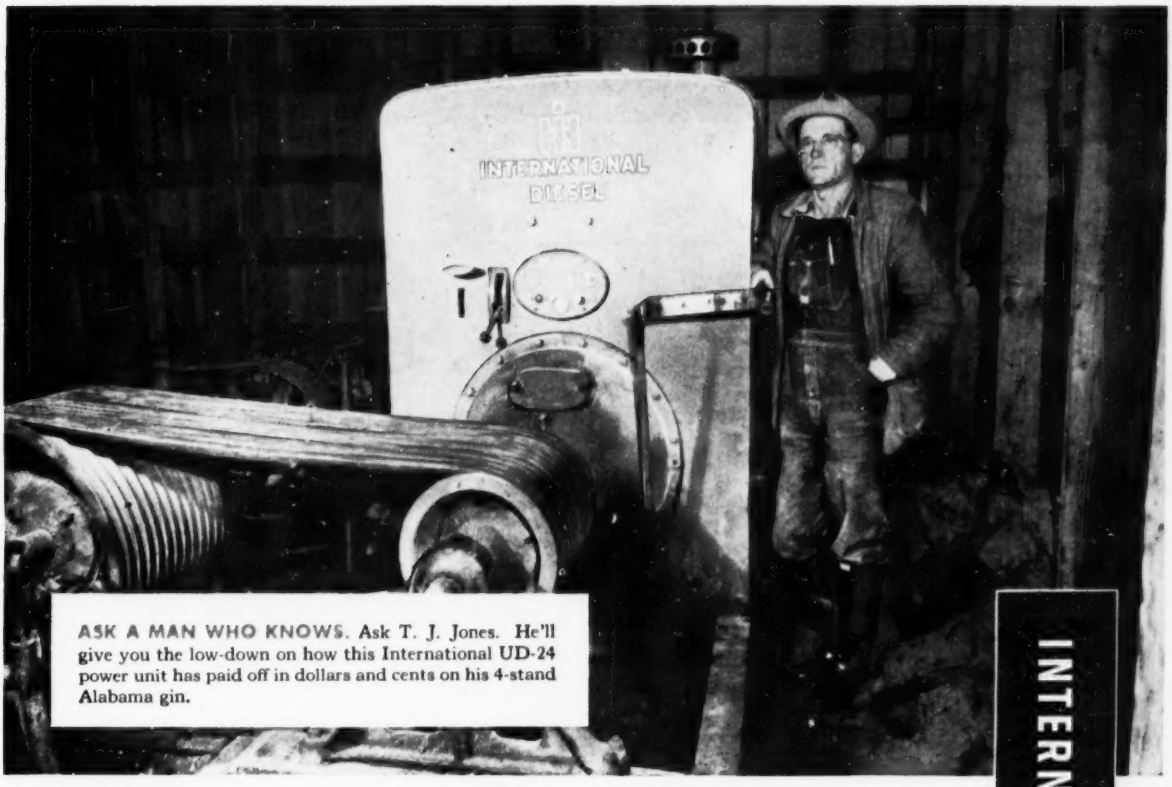

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T. J. Jones owns a 4-stand, 80-saw gin at Fayette, Alabama, where the power to run the gin used to figure out at $1 per bale. Then Jones got a big International UD-24 diesel power unit, and his power costs dropped to around 25 cents a bale.

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Processing of Cottonseed

I. Review of Research To Improve Nutritive Value of Meal and Color of Oil

II. Preliminary Report of Results of Laboratory Research

By A. M. ALTSCHUL and F. H. THURBER
Southern Regional Research Laboratory[1]
New Orleans, Louisiana

Abstract

SOME OF THE commercial meals now available are undoubtedly superior to the average of meals produced by the entire industry and more suitable for feeding to growing swine and poultry. The surveys now in progress will provide a comparison between prepressed-solvent extracted and other types of cottonseed meals. Screw-press meals which have not been heated over 200° F. prior to screw-pressing have been fed to growing chicks and hogs and have been entirely satisfactory as a source of protein. Widespread commercial utilization of the newer knowledge about cottonseed meal nutrition and the effect of processing on oil color depends largely upon the acquisition of more fundamental information. The new findings reported in a preliminary manner in this publication may be helpful in the development of modified commercial processes for producing oil and meal of higher quality.

A REVIEW is presented of problems involved in improving the quality of cottonseed meal and oil and of research to aid in solving these problems. Many of the papers resulting from this program of research are listed in the bibliography.

Some of the laboratory work suggests possibilities for modifying processing conditions to produce better meals and oils. A preliminary report of this work is presented.

I. Review of Research To Improve Nutritive Value of Meal and Color of Oil

WITH THE increases in population and the reduction in number of workers available for agriculture, pressure has been increasing to derive the maximum benefit from the acreage now available and in use for agricultural production. This maximum benefit can be achieved only if products of the highest quality are produced from the agricultural raw material. For this reason, attention is now being directed not only to improving the yield and efficiency of processing of cottonseed, but also to modifications in processing conditions to yield both oil and meal of highest quality.

The nutritive value of cottonseed meal, to swine and poultry, depends to a large extent upon two factors:

1. Low concentration of interfering substances (gossypol and related materials).
2. High protein value (cottonseed protein, like other oilseed and cereal proteins, is damaged by excessive heat and its availability in the animal's digestive system is lowered).

The Southern Regional Research Laboratory undertook in cooperation with the cottonseed industry and nutrition experts to reinvestigate the nutritive

(Continued on Page 68)

[1]One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U.S. Department of Agriculture.

E. T. Harris Retires as Swift Mill Manager

E. T. Harris, manager of the Houston oil mill of Swift & Co., retired on pension Nov. 1, E. F. Czichos, Memphis, division manager, announced. He and Mrs. Harris have many friends throughout the industry who will join The Cotton Gin and Oil Mill Press staff in best wishes for them.

E. T. HARRIS

Harris, a veteran of almost 44 years with Swift, has managed the Houston mill since 1922. Born on a Colorado stock farm in 1888, he moved with his family to Callahan County, Texas, in 1898.

The eighth child in a family of nine, he was educated at West Texas country schools, Baird College, and a Ft. Worth commercial college.

Harris began his service in 1910 at the Bencini cotton oil mills office in Ft. Worth. In 1919 he was transferred to Houston as assistant to the general manager. Three years later he became manager of the Houston oil mill.

Harris married Mary Belle Smith in 1912 at Ft. Worth. They have two children and three grandchildren. The son, Major E. T. Harris, Jr., is with the Air Force in Arlington, Va. He and his wife, the former Emma Belle Sampson of Houston, have a daughter, Margaret Jean.

The daughter, Mary Janet, lives in Venezuela with her husband, Gerrit Willem van Hillo of Holland. They have two children; a son, Harris Willem, and a daughter, Diana Margriet.

Mr. and Mrs. Harris live at 1402 Anita Avenue, Houston. He is an active member of the Houston Chamber of Commerce, Holland Lodge No. 1, the Sons of the American Revolution, and Trinity Episcopal Church, where he has served as a vestryman and missions treasurer. In addition, Harris has been a director of the Texas Cottonseed Crushers' Association and the Houston Merchant's Association, and has served on various committees of the National Cottonseed Products Association.

Mrs. Harris is now president of the San Jacinto Chapter, Daughters of the Republic of Texas, and is past regent of the Lady Washington Chapter of the Daughters of the American Revolution.

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HOOK UP SITTING DOWN ...IN ONE MINUTE

Eagle Hitch now on low-cost 2-plow "VA" Series, new "SC" with 15 percent more power, and big 3-plow "DC" Tractor.

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Plants accurately with uniform flow of seeds from precision-machined boxes to each row. Seeds are uniformly covered on uneven as well as level seedbeds due to flexibility of long-beam construction of planting units. Adjustable for row widths from 36 to 42 inches. Gauge wheels firm soil around seed . . . are individually adjusted. Mounts on rear of big 3-plow Case "DC" Tractor to make compact unit for easy turning, work in close places. See your Case dealer or write for catalog. J. I. Case Co., Dept. L-363, Racine, Wis.

Mechanization Conference Report

Progress and Problems In Mechanizing Southeastern Agriculture

By GEORGE B. NUTT

■ Address at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

PROGRESS has become an infectious word with Southeasterners. We see progress, we hear progress, we feel progressive. New factories, "blankets of green," herds of well-fed cattle, hundreds of thousands of farm tractors and implements, climbing bank deposits and rising per capita income are obvious signs of progress.

John R. Henry, correspondent for INS gave his interpretation in a recent article of what is happening all over the South.

"The industrial revolution spreading through the South's economic bloodstream today has the same dramatic effect as plasma given a person in shock.

"Doctors of regional wealth feel that response to such treatment promises cure rather than the illusory recovery of by-gone times . . .

"While much remains to be accomplished, Dixie is on its way to an economic par with the rest of the nation.

"Average income rose from $803 in 1946 to $1,057 in 1951. It remains considerably below the national average which crawled up from $1,211 to $1,584, but, in ratio, the Southerner's earnings increased more rapidly than those of citizens elsewhere.

"It continues to climb so that the Southern Association of Science and Industry freely predicted private incomes will attain the national average in less than 10 years.

"Latest U.S. Bureau of Census figures show that 219,300 farms threw off the yoke of mortgages over the past couple of years . . .

"Plantations turned to mechanized operations. Many farmers became cattle men. Folks with less land raised chickens. Crop diversification became the rule rather than the exception.

"Florida and Georgia set a national pace by a 51 percent increase of cattle ranching . . .

"In the 20-year period since 1930, deposits in Southern banks belonging to the Federal Reserve system climbed from $2,114,000,000 to $11,946,000,000."

The Southeast proudly shares in this progress report for the entire South.

In contrast to a Texan, I must content myself with being from a small state, the smallest in the Southeast. South Carolina agriculture is rather typical of agriculture throughout the Southeast—except for Florida. So, I will cite our progress in South Carolina as an example of what has happened generally over the Southeast.

GEORGE B. NUTT is Head of the Agricultural Engineering Department, Clemson Agricultural College, Clemson, S.C.

Cash income from farm products marketed jumped from $100,000,000 in 1940 to $380,359,000 in 1952. The farm tractor population increased from 5,000 to 40,855 during the same period. The number of mules and horses on farms reached a new low of 145,000 in 1952 as contrasted with 200,000 in 1940. The principal crops and livestock produced in 1952 were cotton, tobacco, corn, oats, wheat, barley, peanuts, soybeans, lespedeza, peaches, sweet potatoes, Irish potatoes, dairy cattle, beef cattle, hogs, chickens (layers and broilers), turkeys and many miscellaneous fruit and vegetable crops. This enumeration of crops shows our high degree of diversification and accounts for one of the problems in mechanization.

Competition for farm labor has done more to speed up mechanization than any other factor. I will go a step further to say that it has done more to improve Southern agriculture than anything else. About the time farm tractors, combines, etc., were proving their worth in the South a few economists and sociologists feared that power machinery would displace farm labor. Fortunately that condition never occurred. Power machinery replaced farm labor and is continuing to do so. It is giving farmers business independence and the opportunity to make the most of their time.

A high degree of mechanization has been attained in the production of small grain, corn, hay, silage, and soybeans. Many operations connected with livestock production have also been mechanized. We borrowed a lot of know-how and machinery from the Midwest and elsewhere for these crops but those crops that are restricted to a warm climate have presented the greatest problems. Cotton, tobacco, peanuts, and sweet potatoes have been slow to yield to machines but very definite progress is being made in reducing the man hours to produce these crops. The Alabama and Georgia Experiment Stations, cooperating with industry, have almost solved the peanut production problems. The North Carolina Experiment Station reports progress in reducing the labor requirement in producing flue cured tobacco, the greatest consumer of labor of all the major crops of the Southeast. The South Carolina Station in cooperation with USDA has developed a sweet potato digger that has paved the way for mechanizing that crop. Cotton, which has been and remains a very important money crop of the region, is everybody's problem and everybody working together is making progress. In 1952, 37 percent of all cash farm income in South Carolina was derived from cotton. That amounted to $142,291,000. All of the cotton producing states and the Agricultural Engineering Division of USDA banded together and pooled resources in a regional cotton mechanization research program that is bearing fruit. Alabama, Georgia, North Carolina and South Carolina have been giving major attention to the problems peculiar to the Southeast. Geneticists, plant breeders, and manufacturers of machinery, insecticides, herbicides, defoliants, etc., have cooperated in this undertaking. To say that progress has been made is stating it mildly. All phases of cotton production have been mechanized to some extent. The degree of mechanization which can be attained by farmers depends on many things, the principal ones being determination, capital, know-how and weather. Forty inches of rainfall, more or less, per year is a godsend to the area but too much of it at the time of planting, cultivating and harvest may upset the most carefully laid plans. Machines, chemicals for weed control, insect control and defoliation make it possible to avoid many of the bottlenecks and heartaches traditionally associated with cotton production. Many farmers are now planting to a stand and applying a pre-emergence chemical to hold crab grass and some other grasses and weeds in check until the cotton is old enough to cultivate. If farmers are afraid to gamble on planting to a stand, it appears possible that thinning may be accomplished with a contact herbicide without disturbing the protective coating of pre-emergence chemical.

Weed control is the principal problem in mechanizing cotton production in this area. Cotton classified as grassy was not

(Continued on Page 58)

with or without quotas... plan on greater production ... count on lower costs

Bigger yields per acre with lower production costs per bale . . . that's the goal of every profit-wise cotton grower. And it's even more important if acreage quotas are imposed. Higher yields at lower cost are just as vital as price in determining profit on next year's cotton crop.

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• Red Means Danger

GINNERS and warehousemen are being reminded by the National Cotton Council that red tags are used to identify bales suspected of being firepacked, and that other colors should be specified for regular numbered identification tags. Bales carrying the red fire tags should never enter normal marketing channels, but some of them do. This can cause confusion—and increase the danger of mixing firepacked bales with other bales—if ginners and warehousemen use regular numbered identification tags that also are red in color.

• Revising NCPA Rules

TRADING RULES of the National Cottonseed Products Association are being reorganized and clarified, as authorized by the board of directors. The NCPA staff will welcome suggestions from the membership. All recommended changes must be approved by the rules committee and membership in convention, but those having suggestions for changes are asked to send them now to the NCPA office, 19 South Cleveland, Memphis 4.

• Must Comply on All

USDA has announced that a producer will be required to comply with all acreage allotments, with one exception, on his farm for 1954 crops in order to be eligible for price support on any basic crop grown on the farm. This means that he must comply on cotton, corn, tobacco, rice or peanuts produced on the farm. The exception applies to wheat; in this case, a farmer who exceeds his wheat allotment, but does not have more than 15 acres of wheat, will still be eligible for price supports on other basic commodities provided he complies with allotments for those commodities. However, he will be ineligible for wheat price supports.

• 1,372 Pickers in Delta

A RECORD 20 percent of the Mississippi Delta's 1953 cotton crop has been picked by machines, according to an estimate by Ira Welborne, labor analyst for the state's Employment Security Commission. He said that the previous high in the proportion of the state's crop picked mechanically was 13 percent in 1951. Welborne estimated that 1,372 mechanical harvesters were operating in Delta cotton fields in mid-October, and said that no serious labor shortage was anticipated during the remainder of the season.

• Yams Go Yankee

SWEET POTATOES, which are credited with having done much to feed the Confederate armies when other food was scarce, are now gaining popularity with the Yankees. Louisiana, the leading yam state, reports that more than 50 percent of its sweet potatoes now sell north of the Mason-Dixon Line.

• Love Those Trees

TREE APPRECIATION DAY will be observed Dec. 10 by Georgia 4-H Club members who have carried on about 1,500 forestry projects this year. On the special day they will help distribute 2½ million trees. Their goal is to see that every Georgia school child plants one tree. Trees are being donated by paper firms.

• Depleting Water

UNDERGROUND water reservoirs in Texas are in many instances being depleted 10 to 20 times faster than nature is replenishing their supply of water, says A. P. Rollins of the Board of Water Engineers. Rollins added that the ordinary flow of Texas streams is insufficient to meet summer requirements for irrigation and municipal water, but said that proper planning for conservation could solve the problem.

• Buttermilk Battle

BUTTERMILK is causing controversy in North Carolina. Three representatives of the dairy processing industry have appealed a ruling by the State Board of Agriculture against the use of such terms as "churned," "old-fashioned churned" and "country-churned" on con-

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With grain becoming increasingly more important in the agricultural economy of the South, forward-looking cotton ginners have already adapted their operations to include Kelly Duplex grain handling and processing equipment. They've found that this equipment, designed and built for top efficiency, low maintenance and long life, is able to give them steady, year 'round business and employment ...greatly increased volume... and, above all, a GOOD profit. It can do the same for you!

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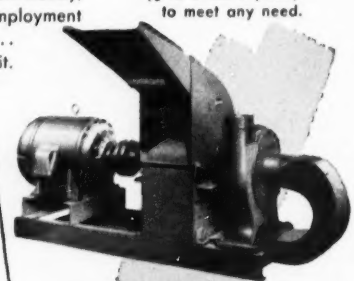

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tainers of cultured buttermilk. Processors said they actually churn their buttermilk, although they use lactic acid cultures in the process. They also said that the public prefers a buttermilk containing small flakes of butter, which is made separately from cream and added to skim milk processed with lactic acid.

• Going to the Dogs

DOGS in the U.S. now total 22.5 million, compared with an estimated 20 million in 1947, according to a survey by the Gaines Dog Research Center. The survey indicates that 40 percent of the homes in the U.S. have dogs, the South leads in the number of dog owning families and—to no one's surprise—that families with children have more dogs than childless families.

• No Quotas for Corn

USDA has announced that there will be no marketing quotas for corn in 1954, although acreage allotments for the crop are very probable. Marketing quotas have never been proclaimed for corn but there were acreage allotments as recently as 1950.

• Use of Soybean Oil May Exceed 1952

INCREASED demand for soybean oil in the manufacture of margarine during 1953 should more than offset the drop in exports, George M. Strayer, secretary of the American Soybean Association, declares.

Although shipments abroad of crude and refined soybean oil for the seven months through July were off over 100 million pounds, or approximately one-fifth of the total for the comparable period last year, soybean oil has been moving to margarine producers this year at a rate 22 percent above 1952, he said. With the expected upturn in margarine production in the final quarter of 1953, the resultant usage of soybean oil in margarine should more than compensate for the drop in exports. Strayer quoted figures just released by USDA and the Census Bureau, which revealed that so far this year consumption of soybean oil used in margarine was running 85 million pounds ahead of the total for the first eight months of 1952.

Use of soybean oil in margarine during August was 35 percent above the same month last year, Strayer reported, and nearly four million pounds over the July total.

During the first eight months of this year 474,230,000 pounds of refined and hydrogenated soybean oil have gone into the production of margarine. S. F. Riepma, president of the National Association of Margarine Manufacturers, recently predicted that the margarine industry would require about 75 million more pounds of soybean oil this year than were used in 1952.

"There are several indications that foreign requirements for soybean oil may rise in 1954," the soybean industry spokesman said. "In the light of a lack of expansion in world supplies of edible vegetable oils during 1953, importing countries may draw on the U.S. for increased supplies in the year ahead," he declared.

"If world consumption levels are to be maintained, stocks replenished, and allowances made for gains in population, much of the world surplus of fats and oils available for export should come from the U.S. market.

"With the shorter crop for domestic crushing, and sharper export competition from cottonseed oil now in government stocks and from Manchurian soybean producers, it may be difficult to match last year's export record of 42 million bushels (soybean equivalent)," he said.

"However," he stated, "Japan has been a heavy importer of American soybeans in the post-war period, and should continue to be unless there is an unforeseen change in the international picture."

The European market has traditionally shown a preference for soybean oil over the hard oils, such as palm and whale oil, he said, and Germany in particular has greatly increased her imports of soybean oil since pre-war days. Modern crushing facilities with considerably greater capacity have been rebuilt there since the war, Strayer said.

"Europe's growing margarine industry is likely to increase the pressure for more imports of soybeans and soybean oil," he declared, "and we are in a position to meet that demand on mutually favorable terms."

Cotton Wardrobe Exhibit

The National Cotton Council has announced completion of a 23-piece year-round cotton wardrobe, made from Advance, McCall and Simplicity patterns, which is to be shown in schools, colleges and women's groups as a part of the Council's educational program.

Southwest

Sensational, New

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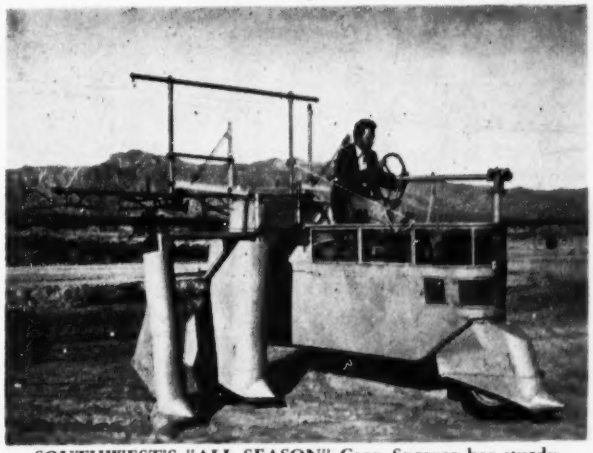

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Ford TRACTOR

◄ *Model illustrated shows self-dumping basket. Also available without basket for use with trailing wagon.*

DEARBORN COTTON HARVESTER

...can increase profits, as proved in actual tests

The Dearborn Cotton Harvester uses a new "brush off" method of gathering cotton. It has proved its ability to harvest more cotton at less cost—at only one-tenth to one-half the cost of hand picking. Naturally, the profit per bale is greatly increased—as much as $40 per bale. Yet, for all it can do, the Dearborn Cotton Harvester is a low cost machine—easy to buy, and practical for small as well as large acreages.

New "Brush Off" Action

The "heart" of the Dearborn Cotton Harvester is the long revolving nylon brushes. These thousands of flexible "fingers" search out the cotton and remove it from the plants in a once-over operation. Burs gathered with the harvested cotton are readily removed by any well equipped gin.

10 Acres Per Day

Up to 10 acres per day can be harvested by one man on the tractor, and the Dearborn Cotton Harvester does fast, thorough work in cotton planted in any row width. It has large capacity—handles high yielding as well as low yielding cotton.

Special Basket Available

This machine can be used with a trailing wagon. Most farmers, however, prefer the mounted, hydraulically controlled basket, sold separately. With the basket, which is dumped from the tractor seat, the machine is much simpler to operate; fields can be opened easier, turnarounds can be made faster and with little damage to the crop. There is more stability on high beds and no side draft on point rows. It eliminates the need for special wagon covers.

Low in Price

Best of all, the Dearborn Cotton Harvester is priced low, well within the reach of the average cotton farmer. Have your nearby Ford Tractor Dealer show you this new cotton harvester. Ford Tractor Division, Ford Motor Company, Birmingham, Michigan.

Ford Farming MEANS LESS WORK... MORE INCOME PER ACRE

Mechanization Conference Report

Mechanization Challenge Of the Cotton Belt

By W. C. MacFARLANE

■ Address at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

OUR COMPANY does not manufacture a cotton picker, but for many years we have furnished machinery for planting and cultivating cotton, and tools for the preparation of the seedbed, through Avery, for 128 years.

With the information currently supplied by divisions, branches, engineers, and others, I have spent considerable time bringing myself up to date on the general aspect of the Cotton Belt mechanization challenge as it exists today, and I will try to high-spot some of the problems as I see them.

My first contact with cotton was in the early part of this century when I got a job in a cottonseed oil mill in Jackson, Miss., and began to learn what a wonderful plant cotton really is. My job was to run a saw filer in the linter room; also to dig out the seed and get the conveyors running when they were stalled or choked up; climb down the blower tubes when there was a congestion (if I could not get somebody else to do it). It is not a very pleasant experience to have them put the gin stands down and the blowers on before you get out of the condenser tubes. I also had to run a friction drive power press and bale the linters. My hours were from 7 a.m. to 7 p.m., six days a week and repair work on Sundays—the rest of the time was my own.

In those days, many ginners insisted that the producer remove all seed from the premises—and a great deal of it was taken home and burned. Of course, the seed as received at the mill was of very short fiber and was principally used for so-called "shoddy material." As I recall, if we could get 40 pounds of lint per ton of seed, it was considered good, and the price was about four cents per pound.

The hulls, to which a large amount of fiber still clung, were then sold for animal feed. I remember that a large wagon drawn by four yoke of oxen used to come over once a week to haul the feed to a stock farm, and we used a yoke of oxen to shift our freight cars around the mill yard.

Some of the cake, I understood, was shipped for human food consumption to some of the foreign countries, including Russia. It was also ground into meal and mixed with various stock feeds. All of this gave me a very high opinion of cotton. Since nothing was wasted, it appealed to my Scotch ancestry.

Some of the cottonseed oil, in those days, I understood, went to some foreign countries and came back here as an adulterant to olive oil.

W. C. MacFARLANE is President of Minneapolis-Moline Co., Minneapolis, Minn.

That was my conception of cotton and its various by-products in the early part of this century, but let us take a look at cotton as it is today.

There have been remarkable changes since those days in the processing and sale of seed and lint products, as well as mechanization of production through harvest. Improvements in plant breeding and proper soil use have played a very important role.

I realize this is old stuff to this audience. I am sure that a manufacturer could add nothing to the learned papers and discussions which we have had, and will have, during this Conference meeting, on such things as the use of fertilizers, seed breeding, treatment of seed to prevent diseases, weed eradication by flame throwers and chemicals, and the further intensification and use of various by-products. It is like the slogan they used to have in the old Chicago Stockyards—"Nothing is lost but the squeal." In cotton, there is not even a squeal to lose—it is all used up.

Since 1910, the cost of farm labor has increased five times. The cost of farm machinery has increased about 2½ times. This makes farm machinery the better buy for the farmer's dollar, and no major industry closely approaches agriculture for the rise in productivity per man since 1940. Labor is reduced on the farm by mechanization, and power machinery takes most of the back-breaking drudgery out of the farmer's day. He produces one-third more, and his per man hour output has doubled since 1910.

Now, when it comes to the cotton farmer, the 1950 Census of Agriculture shows that cotton was grown on 1,110,000 farms. Of this number, 479,000 or 43 percent of the farms harvested less than 10 acres; and 409,000 or 37 percent harvested from 10 to 25 acres. Cotton was the principal source of farm income on most of these farms.

In the Cotton Belt, there were more than 400,000 farms with from 10 to 20 acres of cropland, and more than 300,000 with from 20 to 30 acres; and that is more than 50 percent of the United States total of these sizes. In 1950, there were 566,000 farms in the Cotton Belt with two or more work animals and no tractors. On Jan. 1, 1953, there were approximately 2½ million head of workstock in this area. The current colt crop of less than 100,000 is not sufficient to replace the workstock in the Cotton Belt, even if all these colts were shipped to this area—so there is an increasing shortage of animal power.

Although the farm machinery industry, as far back as the year 1825 by the Avery Company, has contributed the machinery for the preparation of the seedbed and the planting and cultivating of cotton, the problem of harvesting this crop by mechanical means has been the most difficult one to solve that has ever confronted our industry, and it is a long way from a satisfactory solution now as far as the Cotton Belt is concerned.

The principal obstacles to mechanizing small farms is the small income of the owner and the amount of cash required for mechanization, which means the substitution of capital for labor. On most of the small farms, there is more labor than capital; and machinery requires skill in operation and maintenance, as compared with ordinary hand labor still so much in use on the smaller farms.

The challenge of cotton mechanization to the farm machinery industry is a very different problem than those of any other crop. Cotton mechanization speeches are a good deal like the economics exams given by a Midwestern college.

The new president of a university was astonished and shocked to learn that the questions used in examinations for an economics class never were changed from year to year. He summoned the veteran professor in charge to explain.

"Don't you realize," said the president, "that the students pass the questions on to succeeding classes taking these tests?"

"Yes," said the professor with a smile, "but in economics the **answers** change every year."

So it seems to be with cotton mechanization. Seriously, this situation in cotton mechanization means that there is much progress still to be made.

Cotton, unlike wheat, corn, hay, and almost all other food crops, has many active competitors. Cotton is the first major farm crop to be in direct competition with specific products of efficient American industrial plants. These are the "chemical" competitors such as rayon, nylon, orlon and many others.

(Continued on Page 54)

CG&OMPress Photo

PANEL MEMBERS, left to right: Ralph S. Hoisington, J. F. McLaurin, Merrill E. Pratt, Panel Leader J. D. Hays, Jr., Walter Regnery and George Pfeiffenberger.

Mechanization Conference Report

Panel Discussion:

Mechanization's Effects on Post-Harvesting Processes

■ Panel discussion at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953. Panel leader was J. D. Hays, Vice-President, Alabama Farm Bureau Federation, Huntsville.

J. D. HAYS

Panel Leader

WE ALL know that real progress has been made during recent years in the mechanization of cotton production. We know, too, that this progress has not been easy. There have been numerous perplexing problems—not just for the farm equipment manufacturer and the farmer but also for the many persons involved in processing and marketing cotton.

Some of our mechanization problems don't begin and end with production. They linger on and on, staying with us through each of the after-harvesting processes, including spinning. For example, proper disposal of crop residue has an important bearing on **all** subsequent operations and processes. Large stalks and stubble prevent adequate seedbed preparation and make accurate, uniform planting difficult. They hinder weed control by clogging mechanical applicator shoes, rotary hoes, and sweeps. Moreover, they hinder harvesting by clogging mechanical harvesters, by adding foreign matter to harvested cotton, and by lowering harvesting efficiency as a result of a poor stand of cotton which they helped to bring about. Now, when we have such a foul-up in mechanical harvesting, we have one of those problems of the lingering kind. We have a problem that affects ginning, merchandising, fiber quality, and spinning. Such are the problems to be considered by this panel.

With the growth of mechanized production, the gin machinery **manufacturer** has been called upon to develop and produce various cleaners, extractors, dryers, and combinations of equipment. Much research and many laboratory and field tests have been necessary to accomplish this in a relatively short period of time.

Today's **ginner** is not in an enviable position. The farmer expects to receive good turnout and samples regardless of the condition of the seed cotton he takes to the gin; and the competitive position of cotton demands a good job of ginning. So the ginner installs the modern equipment made available by the manufacturer. This substantially increases his investment, increases his fixed and operating costs, and adds to his problem of maintaining a crew qualified to operate a modern cotton gin.

The other segments of the industry have their problems, too. The **merchant** often experiences difficulty in effectively selling cotton that is grassy, stained, overheated, or overmachined. **Fiber quality** is affected by too early defoliation, stains, overmachining, and other factors. The same factors also affect the **spinner**.

These are only a few of the points to be considered during this session. I'm sure the men on our panel today will ably show how their respective interests are affected by mechanization and associated technologies. I'm also sure that their discussions will show the interrelationship of our many problems and how each affected segment of the industry, through full understanding and active cooperation, can make its contribution towards minimizing or completely solving them.

Representing Gin Machinery Manufacturers

MERRILL E. PRATT

President, Continental Gin Co., Birmingham, Ala.

THE WORD mechanization has become one of the most popular in our language. In agriculture, perhaps, to as great an extent as in any industry, mechanization has meant revolution.

The minimum price at which producers will be able profitably to market their cotton in the future will depend, to a large measure, on the fullest utilization of mechanization in the production, harvesting and processing of the cotton crop.

The mechanical harvesting of cotton actually is not new. In the early 1920's sleds and strippers became popular on the plains of West Texas. Although the gin plants in those days were inadequately equipped to remove the high percentage of foreign material brought in with the cotton, the ginner soon learned that effective use could be made of multiple cylinder overhead cleaners and bur machines, which were being developed at that time. Continued improvement was made in overhead and other cleaning equipment and in huller gin design as time went on until today a West Texas gin can produce a good clean bale of cotton from stripped seed cotton containing a tremendous quantity of foreign matter. Sometimes under sandy conditions as much as 3,000 pounds or 3,500 pounds of cotton, trash, sand and hulls are required to obtain a 500-pound bale. The cotton grown on the plains of West Texas was ideally suited for sledding or stripping inasmuch as it was of short staple variety and could be left on the stalk until fully

When it comes to mechanization . . .

Stoneville COTTONS ARE TRIED AND TRUE

Cotton growers like Stoneville cottons for many reasons. Near the top on almost everybody's list is the fact that Stoneville cottons are highly adaptable to mechanical picking. Big, easy-to-pick bolls mean a big saving in harvesting costs.

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developed and usually could be harvested in a dry condition.

Prior to the advent of the mechanical cotton picker (which should not be confused with the cotton stripper), the gin plants in most sections of the Cotton Belt, except Texas, Oklahoma and other areas of the West, contained only a minimum of cleaning machinery. For many years it was generally felt that cotton of the fiber length and quality grown in sections other than parts of the West would be damaged by overhead bur machines and multiple cylinder cleaners, etc. As harvesting practices changed, however, and the seed cotton began to contain more foreign matter and moisture, the need for drying and overhead cleaning machinery was recognized, even in the eastern sections of the Belt.

In the early 1930's cotton driers were tried and today they have reached such a high state of development that two- and even three-stage drying is provided. This permits the handling of cotton at relatively low temperatures but with a high volume of heated air.

During the last 10 years or so there has been a definite trend toward the use of overhead bur machines and cylinder cleaners in practically all sections of the Cotton Belt. This type of machinery, available on the American market today, has been found to produce desirable results, and without the damage which in previous years was thought to have been caused by its use.

About 1944, however, it became generally accepted in the ginning industry that the limits of cleaning seed cotton with respect to grade improvement and preservation of other fiber quality elements had been reached with existing cleaning, drying and hull extracting equipment. About this same time the mechanical cotton picker (spindle type) was rapidly becoming established but its use imposed additional hardship on the ginner because of the natural tendency for the picking spindles to harvest a certain amount of grass and other extraneous material along with the cotton. Moisture, added to the seed cotton in the picking process, further complicated the picture.

During the early 1940's the cotton ginning industry was accused by some of being the "bottleneck" to full mechanization. It so happened that during that very time research and experimental work was being carried on in an effort to develop more effective cleaning and drying processes. In the brief time which has elapsed since the advent of the mechanical picker, cumulative improvements by the cotton ginning machinery manufacturing industry have met the challenge by providing in the properly engineered gin plant of today machinery which will:

(1) Dry the seed cotton within safe temperature limits, making it possible to remove the maximum amount of trash;

(2) Remove extraneous matter from seed cotton without damage to the fiber;

(3) Properly open up seed cotton in preparation for the efficient removal of the remaining hulls, stems, trash, etc.;

(4) Extract the hulls and other foreign matter at top capacity through the use of improved hull extracting feeders;

(5) Give improved gin stand performance in connection with mote removal, improved capacity and freedom from trouble; and

(6) Clean the lint cotton of a high percentage of all remaining trash.

It has been during the past decade that the greatest gains have been made in the ginning industry. The time and money spent in the improvement of machinery and efficient arrangement of the machines in the gin plant have greatly increased the income to cotton producers.

In spite of the fact that during the past decade or so there has been a steadily increasing percentage of foreign matter, moisture, etc., with which the ginner must cope, statistics show that the average grade of the American cotton crop has risen steadily, and particularly during the past three or four years. With the selective breeding of the cotton plants most suited for mechanized processing and with the improved harvesting practices, together with the availability of improved cotton ginning machinery, we feel that the cotton ginning industry is abreast of the times and will stay so.

SPRAYING SYSTEMS

TeeJet® SPRAY NOZZLES

with NEW ConeJet TIPS to end clogging troubles in cotton spraying

COMPLETE NOZZLE supplied with male or female pipe connection . . . and CONEJET Tip.
CONEJET Tip Assembly fits any TeeJet Spray Nozzle . . . replaceable and interchangeable.
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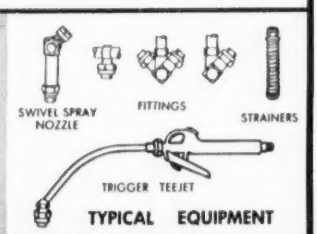


for the best in performance from equipment and chemicals!

Representing Ginning

J. F. McLAURIN

Bennettsville, S.C.

WE ARE facing a revolution in the ginning industry today that was created by advances in mechanized cotton production. The problem before us today is larger than we had expected it to be. In the areas of South Carolina where mechanical harvesters are being operated successfully, the ginner who

installed complete new ginning equipment last season finds that his ginning capacity is not sufficient to handle the constant stream of cotton flowing from the mechanical harvesters. He also finds that the cleaning equipment, which had been ample in the past, is no longer adequate. Lint cleaners are desirable.

This condition will be more of a problem now that the manufacturers are placing machines on the market within the reach of many small cotton producers. In reviewing conditions in the Pee Dee area of South Carolina with which I am most familiar, I find ginners who had never before been bothered by competition, losing customers because they have such limited storage capacity for seed cotton. Wagons and trucks loaded with cotton sometimes line up for such distances that growers have to wait as long as 10 to 16 hours to unload their cotton. Gins have been operating from seven o'clock on Monday morning until midnight on Saturday. We all know how impatient farmers are: It takes nine months to grow cotton but they want to gin and sell in a few hours or at least the same day.

Many ginners and farmers attribute this early harvesting and rush at the gins to "unusual weather conditions." If we look back over the past 15 years, we will find that "unusual weather conditions" have been prevalent. The real reason for this tremendously fast flow of cotton to the gin is the mechanical harvester. In the sections where several machines are operating, the farmer who needs labor to pick his crop is finding that he can get pickers at half the price of previous years. In adjoining counties where there are fewer machines operating, the laborers are asking and getting as high as $4.50 per hundred for careless hand picking. The machine harvested cotton is coming to the gins far cleaner than the average hand picked cotton. In other words, what is called "wages cotton" is no better in grade than mechanically-picked cotton. This is still not true of cotton gathered under the tenant system. But this method is rapidly leaving us, and more mechanical pickers must come into use.

Some farmers with small cotton acreages are getting in on the ground floor of a new and profitable business. Several men in our area with the capital or good credit have bought machines for a normal acreage and, having completed their own harvesting, are doing custom picking. They are having no trouble finding the customers to keep the machines operating both night and day when weather is suitable. The efficiency of these machines seems to vary more with the operator, the stand of cotton, and how clean the crop was cultivated, than with the brand of machine. Custom harvesting could prove to a profitable side line for the individual ginner if he could be sure that his gin capacity could handle the customer's cotton at the desired time.

The day of ample storage space on many farms has passed; therefore cotton must be rushed to the gin. This creates a problem or bottleneck. In the past, the ginning season has varied from three to six months in the heavy cotton producing counties. Now we are facing the problem of having the entire crop thrust upon us in a few short weeks.

To handle adequately this sharp change, the ginner must make many changes in his existing gin equipment. This comes at a bad time for the ginner, since he knows that acreage controls and a short crop are in view for 1954. It seems ill-advised to increase the already heavy investment in the face of a short crop, but the producer will be more insistent on prompt service when he has a short crop. There are two alternatives: (1) increasing the storage facilities, which will increase the liability in case of fire; or (2) enlarging the gin plant to handle more bales per hour. Either of these methods will increase the cost per bale processed.

Gins which have been operating with the barest minimum of cleaning equipment will find it necessary to add many expensive pieces of equipment to meet competition. This will include, in many cases, additional overhead cleaning, two-stage drying, and lint cleaners. Bur machines are recommended by the Ginning Laboratory but some ginners feel this unnecessary due to the lack of burs in the cotton harvested by the majority of the mechanical harvesters. However, the bur machine is still useful for this type of cotton in that it opens up the locks for more efficient cleaning in the final operations. Gins which are already equipped with complete cleaning equipment will find it necessary to speed up the output in order to retain their customers.

The mechanical harvester will enlarge another problem that we have had for several years. The producer who has to use hand pickers will want to get his crop on the market as soon as the man using mechanical harvesting, and will bring rougher harvested cotton than ever before in his haste to get it out of the fields. The only method of discouraging this is to buy every bale of cotton on its merits. However, since there has been too little buying of the individual bale, the careful producer has had no incentive to continue producing premium cotton. This has meant that the ginner has been forced to handle rougher cotton yearly and has been expected to continue showing an improvement in preparation.

Mechanization may either increase the incidence of rough hand harvested cotton or do away with it completely by replacing hand picking. But in any event, the merits of carefully handled cotton must be carried to the individual farmer in an educational program spearheaded by our state Extension Service.

It is my belief that the early harvesting of the crop in the rain-grown areas will result in a higher percentage of the better grades and the low grade production will become hard to sell to an advantage. We will need further research to find profitable uses for high grade cottons in order to keep the demand up to production levels. One of the bright aspects of the mechanization trend is that early harvesting will enable the producer to destroy cotton stalks earlier, and this will tend to help weevil and bollworm control, and greater production per acre the following year.

Our ginning laboratories should publicize their recommendations, particularly at a time like this. This would help ginners decide what equipment they need and eliminate wasted investment in unnecessary equipment. The booklet that the National Cotton Ginners' Association has published should be helpful if kept and used by ginners.

Last but not least, we should have district ginner schools, to be held by state ginning specialists in conjunction with machinery manufacturers. The ginners should be acquainted with methods of properly ginning cotton, and the proper amounts of heat to apply under different conditions. These things have been brought to the attention of farmers and ginners alike in August of this season.

The problem of the ginner in my section has become an acute one in a short period, due to changes in harvesting methods and the lack of proper storage facilities for seed cotton on the farm or at most gins.

Tractor Can Milk If Power Conks Out

Tractors will even milk the cows on the farm, says Elmer R. Daniel, Oklahoma A. & M. College agricultural engineer, Stillwater. Daniel explains that intake manifolds of tractors, trucks or automobiles will supply enough vacuum to operate two or more milking machines when electric power conks out during milking. Some tractors have intake manifolds especially designed with opening and shut-off valve for operating milking machines while others can be adapted for the purpose.

Representing Merchandising

RALPH S. HOISINGTON

Anderson, Clayton & Co., Memphis.

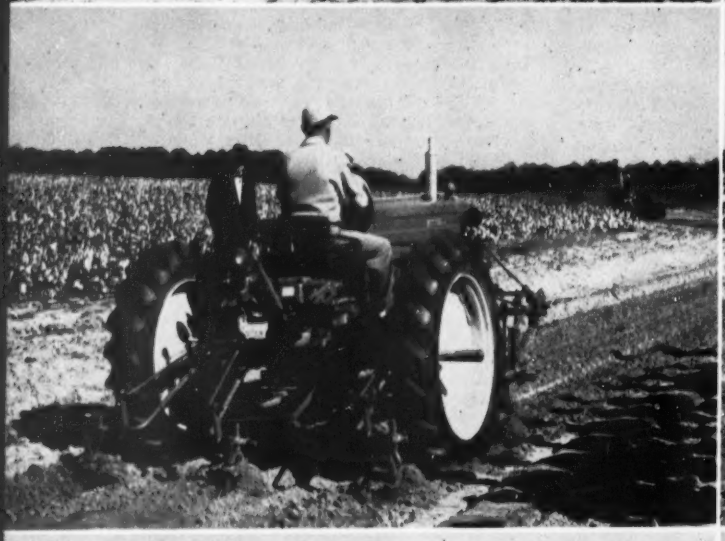
THE VIEWS that I express as a participant in this panel discussion are those of some cotton merchants towards the effects of cotton mechanization.

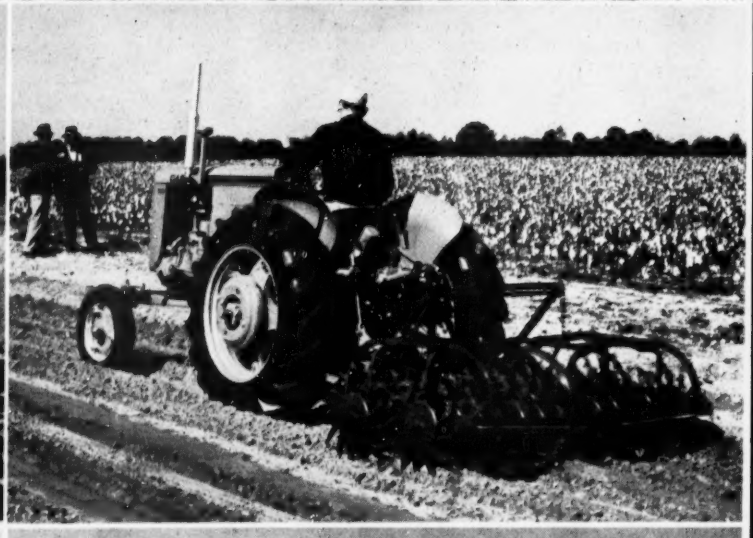
Our attitudes towards mechanization are somewhat conflicting. Our emotions are a bit mixed. We cuss the progress mechanization has made in cotton production and at the same time pray for more progress. These conflicting attitudes are the result of different viewpoints. We cuss it because of the complications it has caused in appraising differences in cotton values. We pray for it because of the effect it has had on cottons' base prices. I will deal with the antagonistic first point of view on mechanization, and then later I will try to explain why as merchants we are for it and wish for its unqualified success.

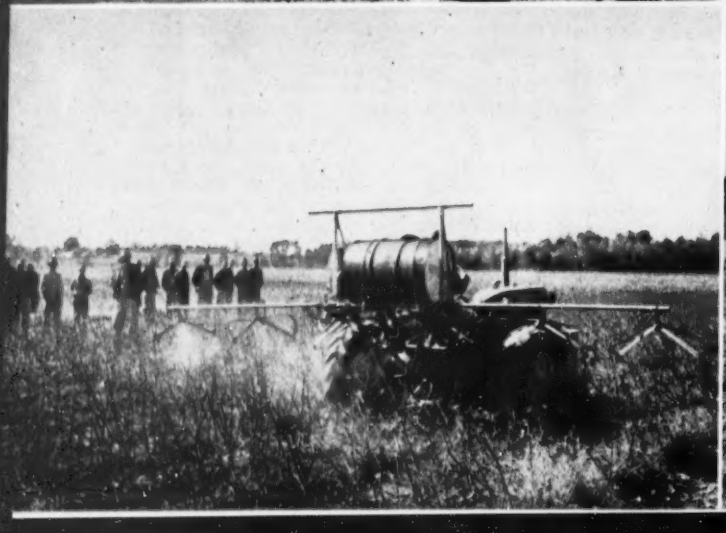
The cotton merchant is the merchandiser of cotton values. Among our primary contributions to the industry are knowledge of differences in cotton values, the descriptions of these differences, and the accumulation of similar qualities in large lots to facilitate the spinners' maintaining top production and proper quality control for his particular end product. As recently as 10 years ago, the determination, description, and distribution of relative cotton values was, compared to today, a very simple process.

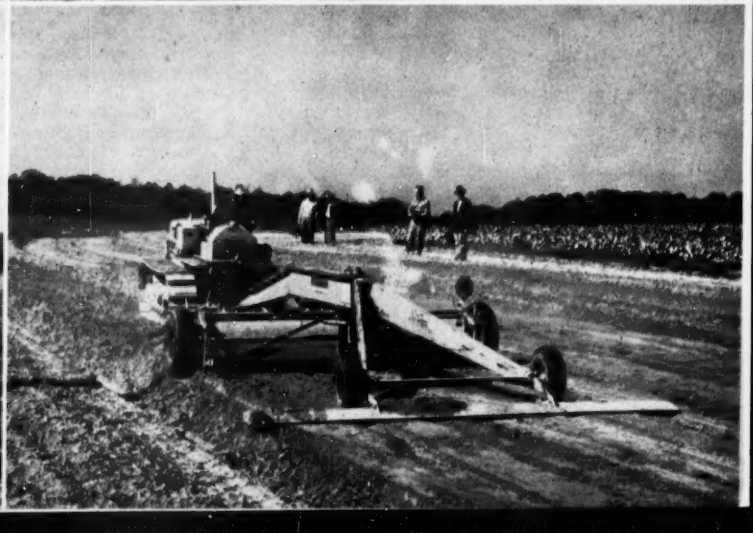
Then most gins were equipped to remove the lint from the seed. Most of the foreign matter that went into the gin in those days ended up also in the bale. The amount of foreign matter was a very good index to the length of time the seed cotton had remained exposed to weather in the field. The leaf present was a guidepost for the cotton

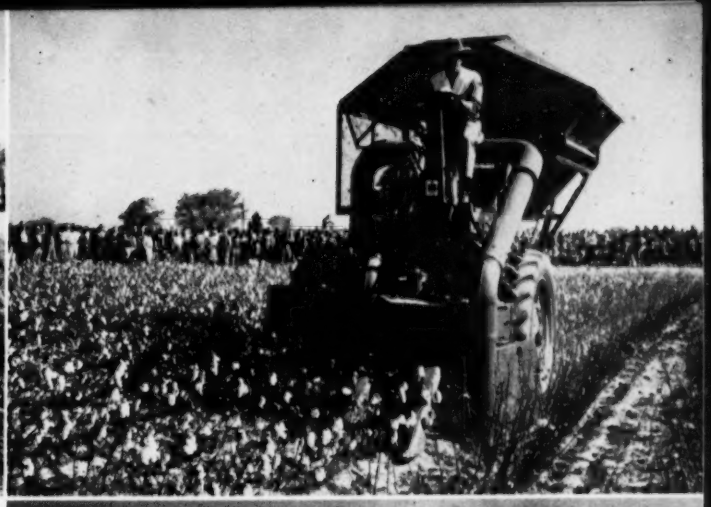
(Continued on Page 65)











At Gadsden, Ala., Oct. 28-29-30

Photoviews of the Seventh Mechanization Conference

■ **COTTON INDUSTRY leaders from every producing state see machines and methods used on small farms during the Gadsden field demonstration on Oct. 30.**

ON THE OPPOSITE PAGE, top left, is shown R. Flake Shaw, general chairman of the Conference, chairman of the mechanization steering committee and executive vice-president of the North Carolina Farm Bureau Federation.

■ At Shaw's right is Charles W. Shepard, Gadsden cotton merchant and chairman of the National Cotton Council's sales promotion committee, who presided at the second session Oct. 29 (pictures of many other Conference program participants appear elsewhere in this issue).

■ Also on the opposite page, at left from top to bottom, under the picture of Shaw, are a line-up of equipment used in the demonstration; a cultivator in action; and a six-row sprayer equipped with wheel and axle shields.

■ Pictures at right on the opposite page, from top to bottom under the picture of Shepard, show a crawler-type tractor and other equipment; a rotary hoe being demonstrated; and a land leveler in action.

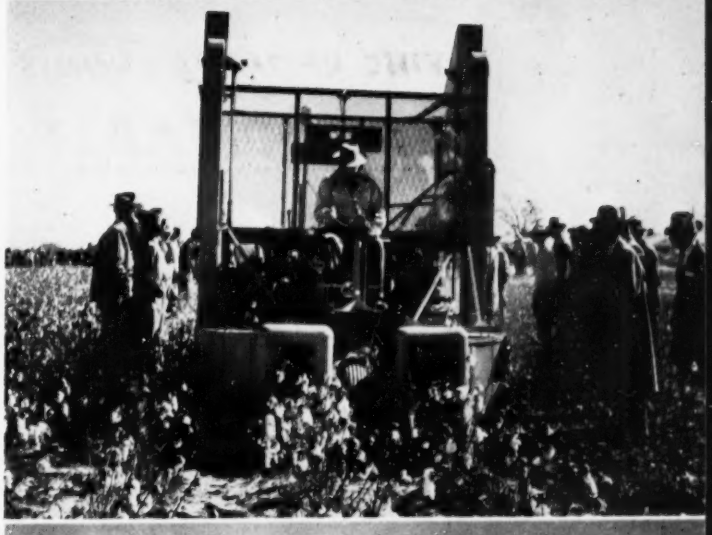
■ On this page, immediately above, is a picture showing just a part of the crowd that witnessed the Sand Mountain demonstration.

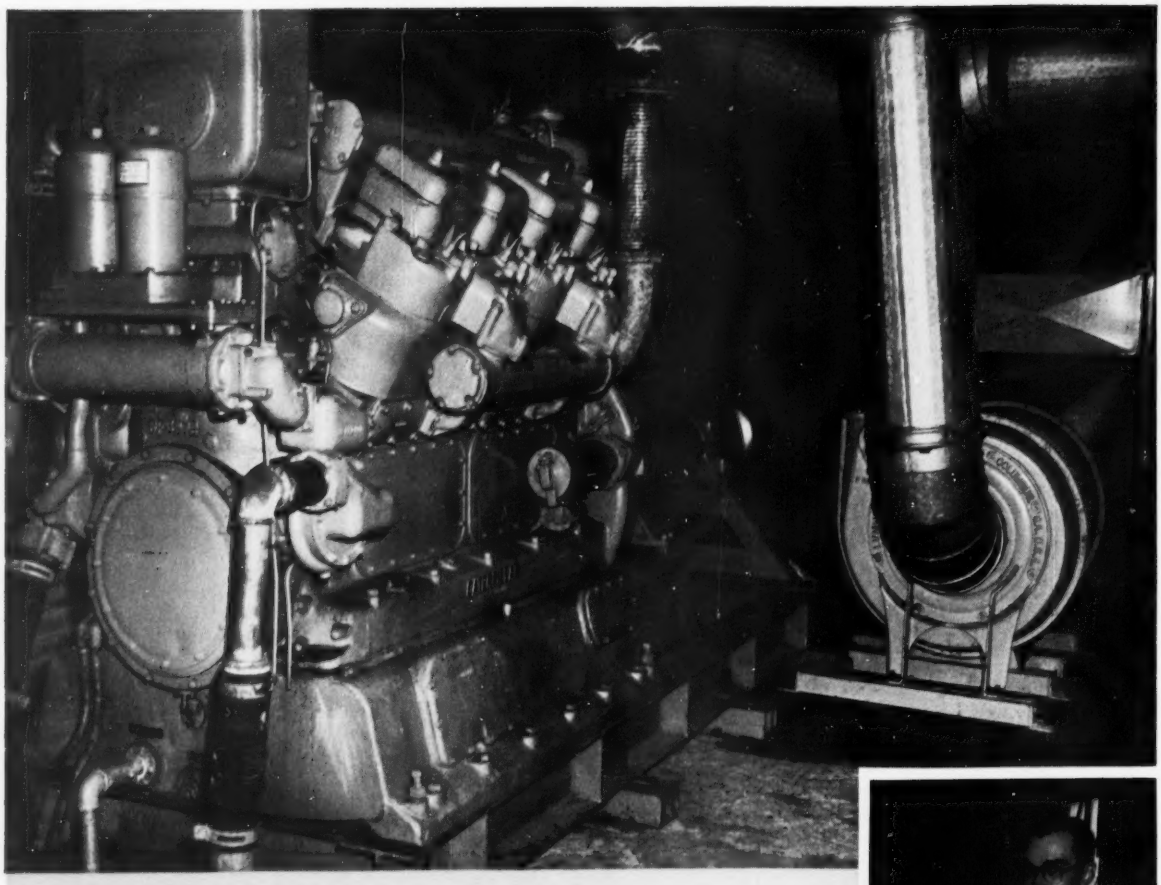
■ At the right, from top to bottom, are two makes of spindle pickers and two makes of strippers in action.

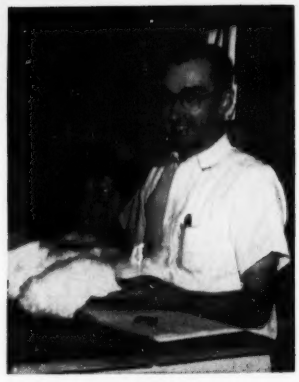
■ The picture immediately below shows a rig applying liquid fertilizer.

■ Other equipment demonstrated included an improvised interplanter for seeding legumes and applying fertilizer in cotton middles prior to cotton harvest; stalk shredders; moldboard plows; wheel-type and integral mounted harrows; rear- and front-mounted planters; and airplane dusters and sprayers.

CG&OMPress Photos







LIVING UP TO ITS PROMISE OF PROFITABLE POWER!

This D364 is the second Caterpillar Cotton Gin Engine purchased by the Hungerford Co-op Gin Assn., Hungerford, Texas. Here's why, straight from Mr. Emil F. Petter, manager of the co-op: "When we enlarged our gin, we needed more power. With our D13000, we never thought of engine trouble, so we knew we'd be pleased with another Cat*. The D364 fits our needs exactly."

This rugged engine powers a Lummus 5-80 outfit. In every way, it is living up to its promise of performance. Working 24 hours a day, every day during the ginning season, it goes right through without an oil change. It uses non-premium fuels—sparingly. And its steady, full power delivers the uniform saw speeds essential for top-quality samples.

That's profitable power—the kind tailor-made into all Caterpillar Cotton Gin Engines. They're simple to operate. They don't pester you for attention. They use low-cost No. 2 furnace oil *without fouling*—that saves you a lot of money and trouble over a season. And if you need service, your Caterpillar Dealer provides it fast!

Get the full facts about this steady, low-cost power from him. Ask him to *prove*, beyond a question of doubt, how it can pay off for you. Call him today!

CATERPILLAR, Peoria, Illinois.

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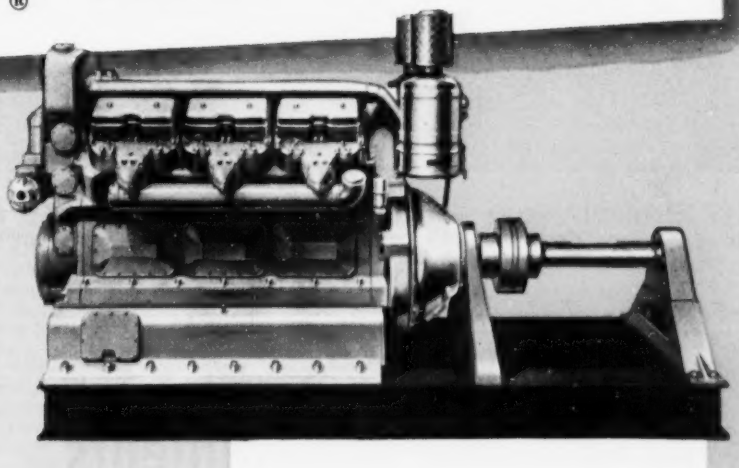
WE'VE MADE CLAIMS... NOW MAKE US PROVE THEM

YOUR HEADQUARTERS FOR
Caterpillar® Cotton Gin Power



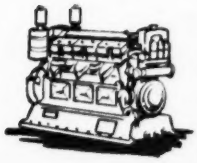
Experienced engine men, who are trained in analyzing the power needs of cotton gins, are at your service at your Caterpillar Dealer. We can quickly and accurately determine your requirements and give you an estimate on repowering with sure-starting, sure-running Cat Cotton Gin Engines. This service is without cost, so call us, today!

MONEY-SAVING SERVICE . . .

Skilled mechanics are ready to answer your call for service, day or night . . . specialized tools and know-how insure a minimum of downtime!

PARTS — IN STOCK . . .

No waiting for replacement parts — we have complete parts stocks for all models of Cat Gin Engines. They're the same precision quality as the ones they replace!



COMPLETE LINE OF GIN POWER . . .

Cat Gin Engines are available in 9 sizes up to 400 HP for continuous duty. A wide selection of mountings, clutches, cooling systems, starting systems and other attachments enable you to custom-tailor power to your preference!

ARKANSAS

J. A. Riggs Tractor Company
Little Rock — Fort Smith — McGhee — West Memphis — Camden

ILLINOIS

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John Fabick Tractor Co.
St. Louis — Sikeston — Jefferson City

TEXAS

Central Texas Machinery Co.
Abilene — San Angelo

R. B. George Equipment Co.
Dallas — Gladewater — Wichita Falls

Wm. K. Holt Machinery Co.
San Antonio — Corpus Christi

West Texas Machinery Co.
Amarillo — Lubbock

CG&OMPress Photo

PANEL MEMBERS, left to right: O. B. Wooten, H. P. Smith, Cecil H. Collerette, Panel Leader H. C. Sanders, H. Brooks James, Conference General Chairman R. Flake Shaw (not a panel member) and H. H. Knowles.

Mechanization Conference Report

Panel Discussion:

Needs and Accomplishments In Cotton Mechanization

■ Panel discussion at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953. Panel leader was H. C. Sanders, Director, Louisiana Agricultural Extension Service, Baton Rouge.

H. C. SANDERS

Panel Leader

COTTON was one of the last great crops to receive the impact of mechanization. However, we have come a long way since I learned to plow with a Georgia stock in 1910. I remember well the first walking cultivators and very distinctly the first time I saw a man on a riding cultivator plowing cotton.

The first tractors were used only for land preparation. The Rust Brothers in garage machine shops at Leesville and Lake Providence, La., in the last 25 years, developed the basic pattern of the first cotton picker. At the Central Louisiana Experiment Station at Eaton Rouge, I saw my first flame cultivator and at an annual meeting of the Louisiana Agricultural Cooperative in Baton Rouge, my first applicator for anhydrous ammonia.

Yes, we have come a long way during my young life. But we still have a long way to go. A machine, really to be successful, must not only replace human labor and perform that labor with less expense; it must also do the job better. In some phases of cotton mechanization we have not yet reached that goal. Generally machine-picked cotton contains more trash than hand-picked cotton. In addition we have not yet learned mechanically to control grass in young cotton.

The biggest job ahead, though, is primarily the one we meet here to discuss. How can we get machines in smaller sizes at less expense? If you take the mechanical cotton picker as your basic unit and then figure the needs in other complementary equipment, land and working capital, your capital needs add up to an amazing total. A few weeks ago I was on two cotton and hog farms in Louisiana. I didn't question either of those men but I am confident that their investment would run $50,000 per full-time farm worker. If I had enough money to establish a cotton production unit completely mechanized, I don't know if I would take the risk. We may be approaching an era when only corporations, or those who inherit large amounts of agricultural capital, or those who acquire capital by some fortuitious circumstance, will engage in cotton production. As one who believes that farmers who own land and work it themselves are not only an economic balance wheel for the nation but a bulwark for our democracy, that prospect gives me some concern.

Southeastern Farmer

H. H. KNOWLES

Headland, Ala.

THE PRESENT economic squeeze in which farmers find themselves, caused mainly by commodity price declines without corresponding production cost declines, causes many farmers to view the future of cotton production in our area with much apprehension and concern. I believe cotton production will continue to be a major enterprise in this area for many years, but unless means are developed for reducing the cost of production, many of our farmers are going to have to accept a standard of living below what we would like to have.

The mechanization of cotton production in this area has been in progress for many years, and progress has been made. I think of the first mechanization as the use of the mechanical horse-drawn planter and fertilizer distributor, then the two-horse cultivator. These came into being a long time ago and we still have acute problems in cotton mechanization even though we have added considerable power equipment to our production methods, without which I do not believe we could have maintained our present position as a producing area.

With the addition of power equipment for cultivation and planting, the cotton farmer faces the problem of maintaining a labor force for chopping and hoeing a few weeks or days in the fall. This is expensive labor if you keep it on your farm; it is also expensive if you are able to obtain it elsewhere.

We are all aware of the fact that a much more concerted effort has been made during the last five or six years to complete the job of mechanizing cotton production and we know that considerable progress has been made. Our experiment stations are working with industry on these problems. So is the Cotton Council and other organizations.

The work with chemicals for weed control, such as pre-emergence treatments to eliminate hand labor for hoeing or chopping, holds much promise. If a satisfactory fool-proof method can be worked out that is not too expensive, part of the problem of keeping that extra labor force will be solved.

Of course, the next biggest problem is in mechanizing harvesting. I agree that we have made progress on this phase of production but we still have a long way to go. Speaking of my own personal experience and my observation of others, results have been quite variable and are certainly not entirely satisfactory. Of course, there are many factors that enter into the picture and affect results. Present trends in mechanization indicate that this problem will be much easier to solve for the large farmer because of the capi-

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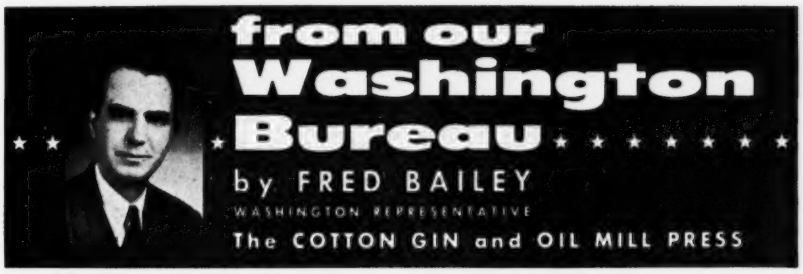


• **Export Picture Looks Better** — Mild optimism over the cotton export outlook is the order of the day in Washington. Economists from across the country, gathered at USDA for their annual outlook conference, were in general agreement with members of the Cotton Export Advisory Committee that things probably won't get worse in the current export year . . . and could get a bit better. Straws in the wind include:

(1) Some $35 million for cotton may be forthcoming from the new $250 million fund provided by Congress for purchase of U.S. farm commodities with foreign currencies. The foreign money, in turn, will be spent by this country to help finance our economic and military aid to friendly nations.

A Southern crop, tobacco, is the first beneficiary under this program. Some $20 million worth will be sent to Britain with the English paying in sterling to be used for economic and military aid. Officials say the tobacco will be in addition to what normally would be purchased by the United Kingdom.

(2) Export-Import Bank credits are to be helpful in moving cotton abroad. Latest example is the short term, $60 million loan to Japan for some 300,000 bales of U.S. cotton.

(3) The final and official report from the Agriculture Department shows that cotton exports in August of this year were double those of a year earlier, and 67 percent above the previous month.

• **A Word of Caution**—Trade and government cotton men in Washington think that there is a reasonable chance to boost export sales this year by about 300,000 bales. Last season foreign nations took approximately three million bales, a precipitous drop of 2½ million from the 1951-52 total.

A word of caution on the outlook for modest improvement in the export picture comes from Arthur W. Palmer, head of the cotton division in USDA's Foreign Agricultural Service.

In the past export year, he says, "We thought the decline would not be more than about a million bales . . . . What we did not allow for was a general failure of confidence in the price level. As our own crop prospect improved, it emphasized that world production was again overrunning consumption by a good margin."

Turning to the future, Palmer observed: "One pivotal factor in the outlook that we have to recognize is the uneasiness that still prevails abroad over prices and the price policies in this country . . . this government has repeatedly assured the trade abroad that no export subsidy will be applied this season and that foreign importers need have no fear that cotton which they buy now will be cheapened later this season . . . . Nevertheless our foreign customers see the world stocks increasing. They note that our own production is overrunning our disappearance and that practically all of the world's stock increase is taking place here. They assume on these grounds that this country sooner or later will act to move the cotton into consumption abroad."

• **No USDA Allotment Formula**—Agriculture Secretary Benson's formal announcement that he will "urge a reasonable increase" in the cotton allotment for 1954 should not be taken to mean there will be a Department formula offered to settle differences of Western and Southeastern growers. The Secretary means to "render all possible assistance" to modify present allotment-quota legislation, but he still would prefer not to become embroiled in a sectional fracas.

Between the lines of the Secretary's recent statement there is clear evidence that he wants growers and Congress to compromise the running fight between Southeast and West. Key lines are these:

"While there has been general agreement that the allotment should be increased above the level permitted by the present law, there have been wide differences of opinion as to just how big the increase should be and how the allotment should be distributed among states, counties and farms. I had hoped during last spring and summer that farmers and their representatives might resolve their differences and agree upon a solution . . . . I am still hopeful that an agreement will be reached by the time Congress reconvenes in January. A number of members of Congress have stated that they would press for immediate action. Their efforts will be greatly facilitated if there is an agreement on the amendments that need to be made in the law."

(EDITOR'S NOTE: A story elsewhere in this issue reports the probability of agreement on a compromise as the result of a meeting Nov. 2 in Memphis.)

• **GOP's Dilemma**—The Eisenhower Administration and Republicans on Capitol Hill are in a tough spot as they shape up farm program recommendations for legislative consideration early in the new year. Their dilemma can be summed up in a question:

How to come up with something that will reassure farmers on prices, and at the same time offset charges of Democrats that it is old stuff they thought of long ago?

It is now an almost foregone conclusion that the GOP will recommend continued price guarantees at current levels beyond 1954 for cotton, tobacco, rice, peanuts and other "basic" crops. Support at similar levels, as a matter of fact, may be sought for additional commodities, but there is nothing new in this. Democrats can say with conviction that it was their idea.

Farmer financed price insurance and a two-price system for export crops may be included in GOP recommendations. These, too, have been considered before, and obstacles to their successful operation are many and stubborn ones.

Texas Ginning Leader, Fritz Lichte, Dies

F. E. (Fritz) Lichte, Texas Extension ginning specialist for many years until his retirement in 1951, died Nov. 2. Services were held Nov. 4 at the First Presbyterian Church at Bryan.

His passing deprives the ginning industry of one of its best known leaders, and many friends throughout the Cotton Belt will join the staff of The Cotton Gin and Oil Mill Press in extending sympathy to his family.

F. E. LICHTE

Survivors include Lichte's wife; two daughters, Mrs. Joe E. Vincent of Bryan and Mrs. R. L. Waldo of Chickasha, Okla.; a brother, Herman Lichte of San Antonio, and six grandchildren.

Lichte became ill Oct. 11 and was taken to Methodist Hospital in Houston.

A native of Germany, he came to Young County, Texas, when less than a year old. He graduated from Texas A. & M. College in 1906 in textile engineering, and was a textile engineer in North Carolina. In 1917 Lichte returned to Texas A. & M. After teaching textile engineering for several years, he joined the Extension Service as ginning specialist and worked for many years with ginners throughout the state.

Fire Destroys Lubbock Gin

Fire destroyed the main plant and seed house of the College Avenue Co-Op Gin, located about four miles south of Lubbock, Oct. 31. Almost all of the gin machinery was damaged beyond salvage, and about 20 bales of cotton were burned. Total loss was estimated at $125,000 by J. M. Johnson, manager.

At a meeting held the day of the fire the gin's board of directors approved plans for rebuilding the plant in the near future.

Cause of the fire was not immediately determined, but it is known that it started in the seed house. Johnson said that insurance will cover approximately half of the loss.

• Britishers Study U.S. Cotton Promotion

BRITISH textile industry representatives arrived in New York Nov. 1 to study U.S. promotion programs and techniques used to sell cotton products.

During a three-week visit, Sir Raymond Streat, chairman of the British Cotton Board, and John Hardaker, the board's public relations director, are undertaking to appraise U.S. selling methods in preparation for a full-scale cotton promotion program of their own. The British, in line with agreements reached at the International Cotton Textile Conference at Buxton, England, look upon harder product selling as the key to cotton consumption problems not only in British domestic markets but in sterling areas as well.

They went first to Memphis, to review promotion and public relations work done by the National Cotton Council.

In Memphis, the British visitors studied Council promotional budgets and programs with staff members. They evaluated special Council campaigns in behalf of canvas awnings, cotton bags, and other industrial products. Procedures and techniques used in the Council's central publicity office were explained, as was the production and distribution of Council radio, movie, TV and press services.

During the week of Nov. 9, Sir Raymond and Hardaker will be back in New York to review campaigns in the Council's Worth Street office. These will include: National Cotton Week promotions, fashion advertising, Maid of Cotton tour activities, men's furnishings, cotton rug and car card campaigns and other programs designed to boost consumer sales of cotton wearing apparel and household products.

The British officials will also talk to leading cotton fashion designers and get on-the-spot reports on garment selection, photographing, advertising agency procedures and selling techniques for individual products such as sheets, towels, and work clothes.

Visits to network television and radio shows to observe how commercial selling is done in these media are also listed on the crowded schedule. So are meetings with cotton export officials, converters, national magazine representatives and other merchandising specialists.

Sir Raymond and Hardaker will conclude their American visit by attending the annual meeting of the Public Relations Society of America, at Detroit, Nov. 15-18.

Upon their return to England, they are expected to adapt their findings to the first cotton promotion campaign ever conducted in Britain. A broad-scale effort is contemplated by the cotton board including industry and fashion publicity as well as product advertising and selling. The initial phase of the campaign will be financed by direct appropriations from the board's treasury.

Delta Directors To Meet

C. R. Sayre, Scott, Miss., has announced that the regular fall meeting of Delta Council board of directors will be held Nov. 10 at the Indianola Country Club. Officers, directors and committee chairmen will attend.

Comeback Program Started By Cotton Bag Industry

The Cotton Bag Market Committee has endorsed a comeback campaign to regain lost ground for cotton in the bagging market.

Committee members meeting recently in New York voted to stage an aggressive sales campaign in 1954 to overcome the price advantages of burlap and paper.

A Save With Cotton Bags Contest will be held next year at state fairs in cooperation with sewing machine manufacturers. Twenty-four new feed bag wardrobes are being assembled for loan to schools and women's clubs.

The committee is sponsored by the Textile Bag Manufacturers Association and the National Cotton Council.

Cattle Feeding Can Hike Farm Income Per Acre

Livestock can help New Mexico farmers increase their income, H. B. Pingrey, New Mexico Experiment Station agricultural economist, points out. He estimates that an average 160-acre cotton-alfalfa farm in southern New Mexico could step up its net farm income from $50 an acre to $75 an acre if 60 percent of the alfalfa were fed to 182 head of yearling steers, bought at 15 cents a pound and sold at 20 cents a pound after feeding 160 days.

■ **GUSTAV BURMEISTER has been named assistant director of USDA's Foreign Agricultural Service.**

John W. Lanier, Manager of Farmers Co-op. Gin, Floydada, Texas Says:

"We made several tests with and without the Moss Lint Cleaner. Our grades ran from a half to a full grade better after going through the Lint Cleaner.

"We made a test comparing turnout on machine stripped cotton, and the lint cleaner took out between three and four pounds and raised the cotton one full grade, making a difference of $12.25 per bale on this cotton.

"We are well pleased and feel that our investment in the Moss Lint Cleaner is money well spent."

John W. Lanier, Mgr.

Farmers Co-op. Gin, Floydada, Texas

Moss Lint Cleaner

MOSS-GORDIN *Lint Cleaner Co.*

3116 Main Street, Dallas, Texas
Third Street & Ave. O, Lubbock, Texas
Box 2663 (DeSoto Stn.), Memphis, Tennessee

North Carolina Study Shows

Mechanization Cost Must Be Reduced

■ IN PIEDMONT area, key to success lies in economical harvesting. Bigger farms and more efficient equipment required.

Larger acreages of cotton and more efficient harvesting machines are necessary for the most economical production of cotton in the southern Piedmont area of North Carolina, according to data gathered by Dr. H. B. James and J. Gwyn Sutherland.

At the present time, they found, savings in hand labor through the use of machines may be offset by other costs associated with mechanization, particularly on small cotton farms.

Doctor James, an economist, is a member of the North Carolina Experiment Station staff, and Sutherland is connected with USDA's Bureau of Agricultural Economics. Results of their study are published in the September issue of the Bureau's publication, The Agricultural Situation.

Only a small number of North Carolina farms, particularly in the Piedmont region, have acreages of cotton large enough to justify the purchase and use of current models of mechanical pickers, they found.

They emphasized that the "key to successful mechanization of cotton production is economical mechanical harvesting," but noted that improvements in methods and equipment will not come overnight.

Their research shows that net returns per acre of cotton producing 495 pounds of lint per acre were as follows: using animal power only and hand labor to weed, chop and harvest, $90 an acre; using mechanical pickers, $94 an acre; and using mechanical strippers, $99 an acre.

Costs on these same acres were markedly different, but the lower value of seed and lint which were harvested mechanically largely offset the decreased production costs.

Production costs were estimated as follows: using animal and hand labor exclusively, $104 per acre; using rotary weeders and mechanical pickers, $66 per acre; and using rotary weeders and mechanical strippers, $55 per acre.

Field loss of cotton was about 12 percent of the total yield when pickers were used. Grade loss amounted to approximately two cents per pound. With strippers, field loss was about seven percent of the total yield and grade loss averaged six cents per pound of lint.

These losses and additional ginning charges amounted to about $40 per acre when mechanical strippers were used and to $34 an acre when mechanical pickers were employed, the researchers said.

The number of man hours needed to produce an acre of cotton by the different methods was as follows:

With hand and animal labor, 138 man hours were needed per acre. When tractor power was used with hand weeding, chopping and harvesting, 118 hours were used. With almost complete mechanization, using rotary weeders and mechanical pickers, 24 man hours per acre were necessary, and only 22 hours were needed when rotary weeders and mechanical strippers were used.

Doctor James and Sutherland pointed out that "the larger the acreage of cotton, the higher the yields, and the more bales harvested per machine, the lower is the cost per bale. Costs of hand harvesting do not vary in this way."

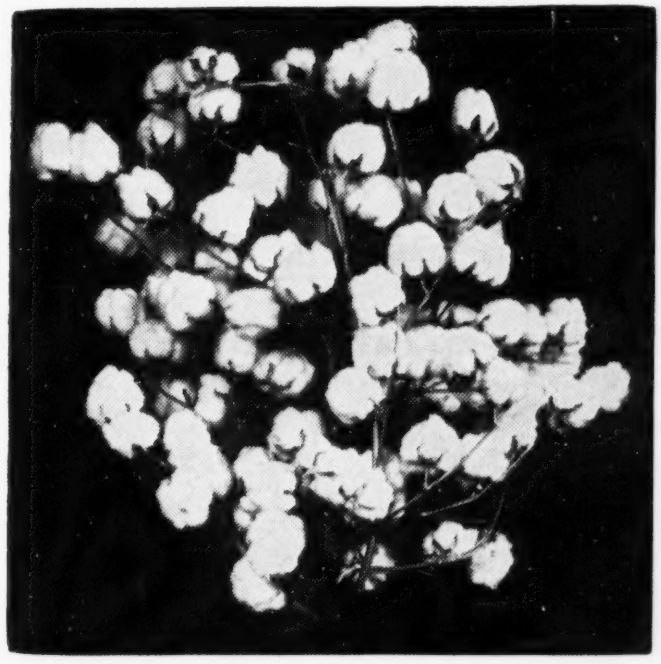
The report continued, "Thus **hand picking** at $4 per 100 pounds of seed cotton picked was more economical than **mechanical picking** on less than 120 acres yielding 337 pounds of lint per acre. But **hand picking** at that rate was less economical than **mechanical stripping** when more than 36 acres were harvested per mechanical stripper."

They concluded that many of the larger farms in the area will mechanize completely and will produce their cotton more efficiently, especially after machinery and ginning methods are improved.

They added, however, that many small farms in North Carolina will not be able to mechanize. "Operators of these farms may find it advisable to shift to production of other crops or livestock that can be produced economically with animal and hand labor." Custom cotton harvesting was suggested as an alternative solution for small farmers.

Bale Tag Sales Increase

Sales of cotton bale tags by the Delta Council Bale Identification Association reached 627,000 by Oct. 16. This figure topped the final 1952 total by more than 100,000 tags.



NORTHERN STAR COTTON

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FOR SALE—One practically new Hardwicke-Etter 20 shelf tower drier with conduit, burner, fan and piping. Also one two trough Continental drier with burner, fan and piping. 5-80 Continental F3 D. C. gins.—Bill Smith, Box 634, Phones 4-9626 and 4-7847, Abilene, Texas.

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FOR REMOVAL—One complete modern 4-80 Murray gin plant. Will sell any or all items from same. Other complete plants available. Also we have an unusual stock of late model miscellaneous machinery ready for prompt shipment. Tell us your needs.—R. B. Strickland & Co., 13-A Hackberry St., Telephone 2-8141, Waco, Texas.

SINKERS CORPORATION, KENNETT, MISSOURI OFFERS EXCEPTIONAL GIN BUY—3-80 Hardwicke-Etter gin in fine condition. Ginned only 2,871 bales, with following equipment: General Electric 150 h.p. motor, operated on only 280 bales. All-steel hydraulic press with three extra complete mandrils. 7-cylinder I-type cleaner with 11-shelf drier. Hull extractor cleaner-feeders. 4-cylinder after-cleaners. Considerable quantity of cotton ties. Complete set of blueprints for relocating gin. Price $20,000 f.o.b Kennett, Missouri. You can be in the gin business on a first class basis for only a fraction of a new gin cost.—Sinkers Corporation, Box 96, Kennett, Mo.

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BUYING NOW FOR MY 1954 STOCK: Wanted—10 and 14 ft. steel bur machines, Continental, Murray V.S. and Hardwicke-Etter flat screen separators, steel conveyor distributors, steel bound and all-steel presses, trampers, late model all-steel gin stands, V-belt Mitchell machines, fans, also whole gins to dismantle. Please give make and price in first letter.—Spencer's Cotton Gin Sales & Service, good used gin machinery for sale. Warehouse 5 miles north Highway 81, Box 204, Georgetown, Texas.

Personnel Ads

WANTED—Night superintendent for mill with four French screw presses. Give qualifications, references and salary wanted in own handwriting.—Delta Oil Mill, Inc., Jonestown, Miss.

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FOR SALE—New and rebuilt Minneapolis-Moline engines, from 35 h.p. to 220 h.p., call us day or night for parts and service.—Fort Worth Machinery Co., 913 E. Berry St., Fort Worth, Texas.

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COTTON PICKER for sale—A two row Allis-Chalmers cotton picker for sale at once. Good as new. Has picked less than 100 bales. Harvesting 95% over in this area. This picker will pick a bale an hour. Cash price $4,990.—Ott Brothers, Branchville, S.C., Phone 2436.

FOR SALE—Two 180 h.p. Minneapolis-Moline used engines—natural gas—outboard clutch. Will run. $660 each.—Buda Engine Sales & Service, Oklahoma City, Okla., telephone Melrose 8-1553.

1—M.-M. TWIN SIX ENGINE with steel vat, cooling coils and tower. In excellent shape.—Call or write Morrilton Cotton Oil Mill, Morrilton, Arkansas. Can be seen on request.

Conway Heads Margarine Committee on Research

The National Association of Margarine Manufacturers has announced the election of Lowell F. Conway, laboratories director of Osceola Foods, Inc., Osceola, Ark., as chairman of its committee on research.

Also announced were the elections of chairmen of three subcommittees: Dr. E. E. Rice, Swift and Co. research laboratories, Chicago, nutrition; James P. Hughes, Mrs. Tucker's Foods, Inc., Sherman, Texas, vitamin A; Dr. Leo Brown, Swift and Co., research laboratories, technical.

The Association has been active in sponsoring research projects on margarine's nutritional values. The subcommittee on vitamin A recently developed an improved method for assaying vitamin A in margarine and reported results of research of the vitamin's keeping values in margarine. Margarine contains a minimum of 15,000 U.S.P. units of vitamin A.

New Gin Plant Completed

Ginning is being started this week at the new $106,000 gin plant at Lancaster, Texas, built on the site of the Farmers' Cooperative Gin which was destroyed by fire Sept. 20.

Status of Ginning Lab In New USDA Set-up

There has been considerable concern in the ginning industry, since the USDA reorganization plan was announced, as to the future status of the ginning and fiber laboratories at Stoneville.

This week the Washington office of The Cotton Gin and Oil Mill Press was advised by Dr. Walter M. Scott of the Agricultural Research Administration that no change in the function, scope of work or personnel is planned for Stoneville.

But one question in connection with Stoneville's status is still to be decided, and that is whether it will continue to report through Beltsville, or through the Southern Regional Research Laboratory at New Orleans.

The feeling in the Department seems to be that in the past Stoneville has been concerned mainly with production, but that more recently the emphasis on ginning and other work at the Stoneville laboratories is more closely connected with utilization.

If it is decided that ginning is primarily concerned with utilization, the assumption is that Stoneville will report through the New Orleans laboratory.

Murray Representatives Attend General Sales Meeting

SHOWN HERE are representatives of The Murray Company of Texas, Inc., in a picture taken Nov. 2 during a three-day general sales meeting at Dallas, attended by members of the firm's sales and engineering staffs. About 85 persons, from the Atlanta, Memphis, Dallas and Fresno, Calif., offices of the firm, were at the meeting. Every cotton growing state was represented.

• Meeting Discusses Linters Problems

PROBLEMS encountered by the users of first-cut linters were thoroughly discussed at a meeting held Oct. 28 in Memphis and attended by linters consumers and oil mill representatives. The meeting was called by the users of linters and was presided over by David Schimmel, Allen Industries, Inc., Rahway, N. J.

Linters consumers pointed to increasing competition in bedding, furniture and automotive fields from rubber, sisal, webbing, imported linters and cotton waste. They also stated that it is increasingly difficult to secure the quality of linters required to meet specifications for finished products. From the discussions, it developed that the cottonseed price support program, by placing minimum prices on first-cut linters, is making the use of substitutes profitable. The price support program also appears to have an influence upon quality in that sales of linters to CCC are made upon government grades which do not necessarily conform to what consumers want.

Mill representatives pointed out that changes in the varieties of cotton planted, in production practices—specifically mechanical harvesting, and in ginning practices have markedly reduced the staple of linters below that formerly produced. It was agreed, however, that, if the specific requirements of the users of linters were better known, the mills might be better able to meet such requirements. To accomplish this, the meeting voted to establish a committee of representatives of the oil mills and linters users which would meet from time to time and discuss mutual problems.

Judges Selected for Maid Of Cotton Finals Jan. 6

Selection of the judges for the 1954 Maid of Cotton contest was announced Nov. 6 by the National Cotton Council. Judges will be Nancy White, fashion editor of Good Housekeeping magazine; W. A. L. Sibley, Union, S. C., vice-president, Monarch Mills; J. Clyde Wilson, cotton producer, Buckeye, Ariz.; Parks Kinnett, president, Memphis Cotton Exchange; Clyde L. Patton, president, Memphis Cotton Carnival Association; Edward J. Meeman, editor, Memphis Press-Scimitar; and Ed Lipscomb, Council director of sales promotion and public relations.

Finals of the contest will be held Jan. 6 at Ellis Auditorium in Memphis. A story elsewhere in this issue lists the Maid's itinerary.

Retired Interstate Official Dies in Sherman, Texas

J. B. Cole, Sherman, Texas, retired official of the former Interstate Cotton Oil Co., died Nov. 3 at Sherman. He was associated with the firm from 1922 to 1939.

Surviving are his wife, a son, Joe Cole of Sherman; a daughter, Mrs. Guy Reynolds of Little Rock, Ark., and two brothers, J. C. Cole and George Cole, both of Bowling Green, Ky.

Tenders to USDA Listed

Tenders of about 2,076 tank cars of crude cottonseed oil, 174 tank cars of refined cottonseed oil, 188,288 tons of meal and cake, and 127,377 bales of linters were received through Oct. 30 by the New Orleans commodity office of the Production and Marketing Administration.

• Acreage Compromise Approved by South

STRONG PROBABILITY that agreement will be reached on a compromise plan to increase 1954 cotton acreage allotments to 21 million acres, plus a national reserve of 315,000 acres, is seen following a meeting Nov. 2 in Memphis. At this meeting Midsouth producers and representatives of Georgia and the Carolinas approved the compromise proposed by Senators James O. Eastland of Mississippi and Clinton P. Anderson of New Mexico.

Similar approval by Western cotton growers would result in general support from the Cotton Belt for legislation to increase the 1954 alloments. The plan calls for half of the 1.5 percent national reserve to be allocated to Arizona, California and New Mexico, with the other 157,000 acres to be assigned to all other states according to their five-year average plantings.

Growers at the Memphis meeting, called by Hilton Bracey, chairman of the Midsouth Cotton Producers Committee, urged that counties be permitted to use the farm record plan for allotments or the county land factor plan, whichever they desire. They also recommended that efforts be made to subsidize cotton exports.

Louisiana Crushers Meet

Members of the Louisiana Cottonseed Crushers' Association held a meeting Oct. 31 at the Roosevelt Hotel in New Orleans. Dr. A. M. Altschul of the Southern Regional Research Laboratory was the guest speaker, discussing new developments in crushing research. NCPA Educational Service Field Representative Dalton E. Gandy discussed the agricultural outlook for 1954.

(Continued from Page 42)

tal investment involved. Such an investment will probably be beyond the means of small farmers for many years.

In summary, I would say that the needs for complete mechanization are greater today than ever. If farmers in the Southeast are to continue to grow cotton in competition with other areas, a means must be found to lower production cost. The need for mechanical equipment to do this job, equipment that does not require excessive capital outlay on the part of the small farmers, is probably the greatest of all.

Southern Engineer

O. B. WOOTEN

Agricultural Engineer, Delta Branch Experiment Station, Stoneville, Miss.

TODAY, there is ample evidence that further cotton mechanization progress means as much the adaptation of the crop to the machine as it does the machine to the crop. In some instances the development of new or improved production methods has resulted from new developments in machinery. The aim has been to provide greater efficiency in cotton production and, in the final analysis, a better end product after ginning.

Improvements in planting methods and equipment offer an example of the progress made in the past few years. These are both important tools in the growing of any crop, and in cotton the new techniques and devices have shown increased efficiency and flexibility in practical application. Planting equipment suitable for cotton and companion crops has been developed, thus making it possible for the farmer to plant practically all of his row crops with a single machine.

Aiding further in this work is a wide variety of implements for the preparation of a seedbed, along with newly developed machines for the application of fertilizers—and new types of fertilizers to use in them.

Two significant advances in cotton cultivation equipment in the past six years have been the adaptation of rotary hoe attachments to the standard sweep cultivator and the general transition from the horse-drawn shovel type cultivator sweep to a lighter high-speed sweep. These additions have increased the utilization of the higher speeds built into the modern tractors. In the past three years there has been limited use of herbicides in the cotton fields of the South as a partial substitute for mechanical cultivation. New chemicals for weed and grass control, however, will probably increase the demand for improved application equipment.

Since 1948, organic insecticides have given good control of cotton insect pests. Low-gallonage spray techniques that have been developed, along with improved ground rigs and airplane methods, have done much to stimulate both early and late season control programs.

Defoliation research is providing new defoliants and improved application processes which promise to remove some of the uncertainties from this phase of production.

The mechanical harvesting of cotton, both with strippers and spindle-type pickers, is gaining momentum every year. Improvements in these machines and greater experience in their use and maintenance have convinced the farmer that the hand picker can be replaced.

This is a brief review of some of the progress that has been made in mechanization. Let us now look at some of the remaining problems. Although seedbed preparation studies made in the past should assist the farmer in determining the best method of preparation according to soil types, much is yet to be learned before fool-proof recommendations can be made.

There are also demands in certain areas for planter improvements, especially in the heavy clay "buckshot" soils of the Mississippi Delta.

Improved metering devices and soil applicators are needed for the application of both solid and liquid fertilizers. A principal need is an accurate metering system that will facilitate easier calibration of the amount of material to be applied.

The primary need in harvesting equipment is a smaller, less expensive machine, particularly for farms of small acreages. Increased competition among manufacturers will no doubt hasten developments in all sizes of mechanical harvesters. Greater skill in the operation of both production and harvesting machinery is one phase of mechanization that should be emphasized. The average farmer is not getting the optimum performance that present-day machines are capable of providing. A large percentage of repairs is caused by abuse rather than normal wear. Casual observation often reveals serious mishandling of machines by some operators.

Since machinery requires a high capital investment, it follows that education toward its most efficient use should help bring a higher return from this investment. Any farmer who is interested in learning to operate his present machines with maximum efficiency will undoubtedly be in a good position to benefit from the advancements in new machinery as they come.

Federal Red Tape Made of Cotton

The federal government has reported exactly how much red tape it used last year—366 miles of it. It is made of cotton and costs 53 cents for a 72-yard spool. The government bought 8,950 spools of the product at a cost of more than $4,700. According to the latest federal supply service catalog it is the only kind of red tape that the government uses — although there are sure to be critics who will question this statement.

Government agencies use the tape almost exclusively for tying up documents for storage. Incidentally, there are enough red-tape-bound government records throughout the country to fill seven Pentagon Buildings, according to the General Services Administration.

Western Farmer

CECIL H. COLLERETTE

Casa Grande, Ariz.

IN THE ANIMAL KINGDOM there's a lot of difference between the mule and the cat. But in the realm of the Arizona cotton grower, there's even more difference between the hay-eating mule that broke soil for the first cotton in the state, and the petroleum-fed "Cats" that now drag their soil-stirring tails across more than 600,000 acres of cotton land in the state.

The difference between the mule and the "Cat" is the story of cotton mechanization in Arizona, where we have faced the immense task of turning raw desert into productive farm land, and of then raising the crop efficiently enough to cover the high costs of irrigation farming. Without modern machines we never could have done that job.

The Arizona farm is a mechanized farm, accepted as such by our people without any particular thought. The farmer in Arizona who does not use four-row tractor equipment is not only the exception but stands out like a mountain among his neighbors.

Every acre of cotton in Arizona is irrigated. To make economical and efficient use of our water we carefully level our fields. So from the time large crawler-type tractors come in with gang plows through cotton harvesting, tractors and tractor equipment figure in every operation.

Maybe that's why Arizona growers are so ready to snap onto every new machine that appears and shows promise of eliminating another hand operation. I think we've had more than our share of farmer-invented tools — mechanical hoes to thin stands of cotton, weeding machines to keep grass weeds out of the rows, water furrow turners, refinements of machines invented elsewhere and adapted to our needs. Many of these have been taken over by national farm equipment manufacturers to become standard throughout the Southwestern and Western areas.

The one major hole we have yet to plug in the mechanization of our cotton growing industry is cultivation. Though some areas seem to have had success with flame cultivation, little has been done with that method in Arizona. Our own University and Experiment Station have been handicapped in testing this and other new developments by lack of funds.

Most of the experimental work has been done by individual growers and we can report that during this past season flame cultivation was successfully used for the first time. One large grower is quite pleased with the results obtained on about 2,000 acres. Two or three other growers also had good results this year so it looks as if we are well on the way to eliminating our last big requirement for hand labor in the production side.

Some experimental work with a herbi-

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cide (CMU), after the cotton is up also looks promising.

Our people, in an attempt to do away with as much hand labor as possible, have tried machine blocking, cross cultivation and drop-plate planting. The increased use of mechanical pickers and latest research seem to indicate that by planting less than 20 pounds to the acre of well-delinted seed, we can do away with thinning, thereby reducing labor requirements.

Of course, the most spectacular advance in mechanization has been in the harvesting of the crop. Two or three years ago Arizona received the largest single rail shipment of mechanical pickers ever sent to one dealer. Since then, farmers have bought hundreds of the machines, and hundreds more arrive in the state each fall to pick on a contract basis.

Year by year we have increased the percentage of our crop that is machine picked. Preliminary estimates are that about 45 percent or 425,000 bales of our 1953 crop will be machine-harvested, so we feel Arizona is keeping step with developments in this field.

We still need a reliable defoliant plus experience and knowledge as to how to get the best results from defoliation.

We in Arizona also believe the manufacturers of picking machines should give some thought to the possibility of developing a high-drum machine for our particular needs. The very rank growth of cotton in our state, with considerable acreages of upland cotton growing as much as six and seven feet tall and producing two bales per acre, puts a burden on present pickers they are not well equipped to handle.

One of the most interesting developments along the mechanical harvesting line, however, came just a month or so ago, when a Phoenix contract service company announced a package deal which includes bottom defoliation and picking of the bottom crop of lint separate from the top crop.

Using a new type Bean spray rig that untangles the rank cotton as it applies defoliant chemical to the bottoms of the plants five rows at a time, this company then removes the top three to five spindles on its pickers and picks the bottom bolls without in any way harming the immature top bolls.

In this way, a bale-and-a-quarter to a bale-and-a-half of seed cotton is picked early in September when the lint is at its best grade, and the gins have time to do the best possible job of ginning. This first picking pays the farmer's costs, leaving the top crop to be picked later for cream.

This contracting outfit is pointing the way to better picking in another way, too. Its picker drivers, for instance, are not permitted to make any adjustments whatever. For each five machines in the field there is a mechanic on hand to check and replace any worn parts. He has a truckload of parts with him in the field. There is also a man at the end of the row to check each machine's efficiency and to make any necessary adjustments.

With the price of cotton down, and with acreage allotments ahead, picking machine efficiency is going to be at a premium, and machine repair and maintenance bills are going to have to be kept at a minimum. Probably the role of contract harvesters will become increasingly important in the future.

Another Arizona contractor has found that substitution of a special grease lubrication system for the spindles results in very low parts replacement costs. In fact, he operated on a full picking schedule last season, and at the close of the season replaced only one spindle, and that was found to have been defective by the manufacturer.

In conclusion, I would summarize by saying that Arizona cotton production and harvesting is highly mechanized but that we farmers see need for further progress. When we can control our weeds by mechanical or chemical means to a much greater extent than at present and when we can pick 85 percent of our crop by machine, we will feel that our business is approaching the peak in efficiency. We will then be able to sell cotton on the world market in competition with any foreign growth or any synthetic and show a reasonable profit.

Southwest Engineer

H. P. SMITH

Agricultural Engineering Department, Texas A. & M. College, College Station.

THE SOUTHWEST has seen many new developments in mechanized cotton culture during the past few years. But, there are a multitude of needs which, if filled, would be of great help to the cotton farmer. A few needs are listed as follows:

1. Better crop residue disposal equipment for both cultural and insect control practices. The disposal of large cotton stalks is only half achieved if the stubble and roots are untreated.

2. A type of seed selection mechanism that will meter out a precision quantity of seed.

3. A standardized type of furrow for planters is needed for both on-the-bed and in-the-furrow planting.

4. A standardized type of furrow opener on planters for the side placement of granular fertilizer. This opener should give a minimum soil disturbance and be relatively free of choking with clods and crop residue.

5. A fertilizer furrow opener for cultivators that will permit the positive application and placement of fertilizer as a side dressing.

6. Better types of seed and fertilizer tubes are needed. Perhaps a camera-bellows type of tube made of cotton fabric could be developed or the boxes mounted closer to the ground.

7. A recommended standardized design of rotary hoe wheels and tines for cotton culture.

8. Better mechanical and chemical weed control equipment, chemicals and practices.

9. Well designed tractor wheel fenders that can be used with cultivators, sprayers, and dusters should be available at most implement dealers.

10. There is need for a defoliation chemical that will cause cotton leaves to drop under various growth and climatic conditions and to inhibit re-growth for at least 15 days.

11. Equipment, chemicals, and methods for the control of the pink bollworm and other cotton insects.

12. A low-cost mechanical cotton harvester.

13. A green boll eliminator for cotton strippers.

14. Sponsorship of the adoption of a standard 40-inch row spacing for cotton by the equipment industry and all cotton trade agencies.

15. A committee from industry and the cotton trade to work on the standardization of equipment and practices for cotton culture.

Accomplishments

The decade from 1943 to 1953 may go down in history as the period when cotton became mechanized in the Southwest. More developments in equipment and mechanization practices were adopted during the past 10 years than in all the centuries cotton has been grown.

For example, during this period the following types of equipment and practices have been introduced in the Southwest:

1. Stalk cutter-shredders.
2. The widespread use of the forward- or centrally-mounted middle breaker.
3. The extended use of the rotary hoe in cotton culture.
4. The use of anhydrous ammonia as a fertilizer for cotton.
5. The use of chemicals for pre- and post-emergence weed control.
6. The development of high-speed type sweeps for cultivators and the touch control hydraulic lifts for tractor-mounted equipment.
7. The introduction and widespread use of organic chemicals for the control of insects.
8. The development of spraying equipment for tractors and airplanes.
9. The development and general use of defoliation chemicals.
10. The introduction and uninterrupted use of tractor-mounted mechanical cotton strippers.
11. The introduction of a successful mechanical cotton picker.
12. Extensive improvement of ginning equipment for handling of rough harvested and mechanically harvested cotton to produce high quality lint cotton.

What have been the results of these accomplishments? This past year, I have traveled across Louisiana, New Mexico and Arizona. Then too, I have traveled the length and breadth of Texas. During these thousands of miles of travel, it was a rare sight, indeed, to see an animal working in the field or pulling a wagon on the road.

The power used on the cotton farms of the Southwest is tractor power.

The horse-drawn wagon of single-bale capacity has given way largely to rubber-tired trailers of two-, three-, and four-bale capacity.

It is estimated that 50 percent of the eight million acres of cotton grown in Texas in 1953 was planted to a stand. This practice ranges from the Rio Grande River on the south to the High Plains on the north. Hoe labor is used largely for the destruction of weeds.

Most of the hand labor in the Southwest is for harvesting. This is rapidly being displaced by mechanical harvesters.

On Sept. 10, I attended a field day at Temple, Texas, which is in the heart of the Blacklands. The field day was devoted entirely to the demonstration of cotton stripping machines of which there were seven makes.

Oscar J. Grossman, a cotton farmer near the Temple Station, who has for several years been adopting research findings, was at this fifth cotton stripper demonstration. He stated that he had planted a variety of cotton suitable for

stripping and used a defoliant to drop as many leaves as possible, then used a desiccant to kill and dry up those leaves that did not drop. Then with his son operating a two-row cotton stripper and his wife as water-girl and cook, they harvested 16 bales of cotton the first day, with a late start. The next day they harvested 20 bales and there were three bales left for the third day. This was early in the season, the gin was near, and he got his cotton ginned as rapidly as he harvested it. So, by September, he had his crop harvested, stalks cut, land plowed, and the year's work finished.

That is just one of many examples of how mechanization is coming to the Southwest.

Agricultural Economist

Dr. H. BROOKS JAMES

Head, Department of Agricultural Economics, North Carolina State College, Raleigh.

THE PAST DECADE has provided an environment in which one would expect considerable progress in the mechanization of cotton. Employment has been at a high level and wages have more than doubled. The cotton farmer is no longer faced with the problem of finding employment for the people on his farm, but with the problem of producing cotton as efficiently as possible. In this environment we have witnessed much progress in the direction of cotton mechanization. In spite of this encouraging progress, many problems remain to be solved.

Accomplishments

On the progress side of the ledger, there are five areas in which substantial accomplishments of cotton mechanization have been made. First, substantial progress has been made in obtaining a desired stand of cotton without resorting to hand thinning. The development of better planters and the use of mechanically or chemically delinted seed enables the farmer to plant to a stand of cotton. Chemical treatment to combat disease enables the farmer to retain a stand even under adverse weather conditions. This eliminates much of the need for hand or mechanical thinning. Even where cotton is drilled in the row, mechanical choppers may be used to thin the cotton. Obtaining the desired number of plants per acre without resorting to hand thinning materially reduces the labor requirements for production of cotton.

Second, the recommended varieties of cotton grown in the Southeast are rather well adapted to mechanical picking. For the high plains areas of Oklahoma and Texas, varieties of cotton which are more storm-resistant and more desirable for mechanical stripping have been developed by plant breeders in those areas. Although present varieties may not be all that is to be desired, substantial progress has been made in plant breeding of cotton during the past decade.

Third, progress has been made in the control of weeds. The use of chemicals, rotary weeders, and plain cultivators in an effort to control weeds represents real progress in this area. Although the weed problem is far from being licked, we can count these innovations as accomplishments along the road to the solution of the weed problem.

Fourth, although present methods of defoliating cotton are far from satisfactory, credit must be given for progress in this area during the past decade.

Fifth, substantial progress has been made in the development of satisfactory mechanical harvesters and accompanying ginning facilities necessary to handle mechanically harvested cotton. New machines have been developed and old machines have been improved. Field and grade losses have been reduced.

Problems

All of the problems of cotton mechanization have not been solved. In spite of the progress made during the past decade, there are many problems remaining.

First, a more satisfactory method of weed control is needed for the humid areas. If hand hoeing is to be eliminated, satisfactory ways of controlling weeds must be found. At present weeds interfere with mechanical harvesting and tend to lower the grade of cotton.

Second, a reliable defoliant which can be applied only a short while before harvest time and which will prevent a second growth of green leaves is badly needed. Good defoliation is essential to efficient mechanical harvesting of cotton which results in a high grade of lint.

Third, a cheaper mechanical picker for use on the thousands of small cotton farms in the Cotton Belt is needed if we are to continue to produce cotton efficiently on these farms. Such a machine must be one which will harvest cotton with little field loss. The production of cotton on small farms by hand does not promise a high standard of living for those families involved.

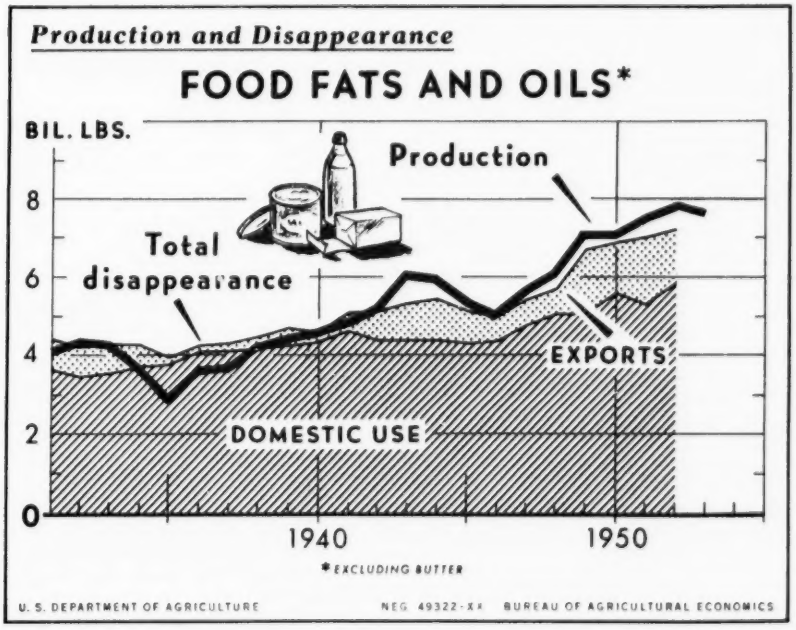
Fourth, there is real need for lint cleaning equipment which will remove grass as well as the fine pin trash in mechanically harvested cotton. Maintaining the quality of mechanically harvested cotton is a real problem.

Fifth, there is need for a cotton plant which matures all bolls at about the same time and which stands up well, picks easily, but is storm resistant enough so that the cotton does not blow out on the ground before harvesting time. Also, earlier maturing varieties would be better for humid areas. Although the plant breeders have done a good job, their job is by no means finished.

Sixth, there is room for improvement in the marketing of cotton. There is some evidence to indicate that mechanically harvested cotton is being discriminated against by some mill operators even though it has been carefully graded and labeled.

Mechanization Holds Real Promise For Efficient Cotton Production

Substantial progress has been made in the mechanization of cotton. Many problems remain to be solved. Cotton mechanization is the key to efficient cotton production in the future. The productivity per unit of labor involved in the production of cotton using non-mechanical methods is simply too low to provide an acceptable standard of living for farm people or to entice labor to remain in cotton production. Higher price for cotton alone will not give the inefficient producer an adequate standard of living. More efficient mechanical production is the key to reduced cost of production. Research is unlocking the door and allowing many profitable innovations to flow into the cotton areas resulting in more efficient production of cotton. The future promises more innovations in the direction of greater efficiency in the production of cotton.



PRODUCTION of food fats has increased much more than consumption during the past two decades, the above USDA chart shows. As a result, the U.S. exported about 17 percent of its domestic production of fats, oils and oilseeds during the 1949-52 period, whereas there were net imports of fats and oils in the 1930's. Output of food fats in 1953-54 is expected to be less than requirements for domestic use and exports, resulting in some reduction in stocks this season.

Mechanization Conference Report

Tour and Field Demonstration

By T. E. CORLEY

■ Remarks in connection with the tour and field demonstration, Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953. Commentator was T. E. Corley, Associate Agricultural Engineer, Alabama Polytechnic Institute, Auburn.

THE FIELD DEMONSTRATION has been planned to show machinery and methods that play an important role in the complete mechanization of cotton in this area. Some of you came here with the expectation of seeing small, one-row, hillside equipment. For complete mechanization of cotton, we must use tractors and equipment of at least two-row size. Only partial mechanization is possible with one-row equipment. While most of the machines that we are demonstrating are the same as those used in the mechanized production of cotton in other areas, we hope to show you how these machines may be adapted for use here.

1. Cover Crop Seeding

A good way to increase cotton yields is to grow leguminous cover crops. To make a good growth of cover crops in this area, the seed must be planted before cotton is harvested. The first machine shown is an improvised interplanter for seeding legumes and applying fertilizer in cotton middles before harvesting the cotton. It may also be used to seed such crops as oats and wheat in cotton and grain sorghum.

2. Crop Residue Disposal

Proper disposal of crop residues pays dividends by eliminating clogging when plowing, planting, cultivating, and harvesting. Cotton stalks should be cut fine and close to the ground, as soon as the cotton is harvested.

Also, we are showing two of the many makes of power-driven shredders on the market that will do a thorough job of shredding cotton stalks. The horizontal blade-type is preferred over the vertical blade-type because it can be used for clipping pastures and other crops.

3. Seedbed Preparation

A well prepared seedbed is important. It influences all succeeding machinery operations. Complete turning of crop residue well in advance of planting, elimination of clods, and firming of the soil are all necessary. A smooth seedbed results in more efficient planting, cultivation, and harvesting operations.

First, we are showing the plows. The moldboard plow is popular for seedbed preparation, especially in this area and the Lower Coastal Plains. Since the advent of low cost shares, moldboard plows have regained popularity. The disk plow can often be used to do a satisfactory job when the ground is too hard for moldboard plows. It is a popular tillage implement in the heavier soils of the Piedmont and Limestone Valley. Although few two-way plows are being used, we have found them very useful in contour farming because they aid in proper terrace maintenance and eliminate many dead furrows.

Another phase of seedbed preparation is harrowing. The harrow plays an important role in firming the soil, eliminating clods and early weeds. Wheel type harrows are filling a definite need in this area where implements have to be moved from field to field over roads and highways. Also the lift-type or integral mounted harrows are easily transported from field to field and very maneuverable.

Land levelers or planes are used primarily in western irrigated areas, but their value in this area is just now being realized. We find them excellent tools for smoothing the land between terraces to eliminate ridges and low spots. This has proved to be a definite advantage for precision planting and cultivating and for mechanical harvesting. The first machine demonstrated is a smaller, mounted type leveler that is very maneuverable. The next machine is a larger, trail type leveler suitable for the large operator.

4. Planting

The main objectives in planting for mechanical harvesting are uniformity and control of plant size and shape. Close spacing in the drill tends to produce relatively small, uniform plants with short limbs and higher fruiting. A plant population of 40,000 to 50,000 plants per acre at harvest time is desirable. Tests have shown that the plant population can vary considerably without affecting the yields as long as plants are uniformly distributed. Cotton should be planted to a stand and solid in the drill.

We are showing both rear and front mounted planters. Rear mounted planters are used in considerable numbers on small farms in this area. The front mounted planter is equipped with large press wheels and a sprayer for applying pre-emergence spray. This same sprayer, with the addition of the boom, may be used for insect control and defoliation.

5. Weed Control

Clean cultivation is important for mechanical harvesting. We have had very good results with chemicals for controlling weeds. However, most farmers in this area still have the "wait and see" attitude about chemical weed control.

Timely and frequent use of the rotary hoe and sweeps will eliminate most of the hand labor. The main disadvantage of the rotary hoe is that it cannot be used during wet weather. Sweep cultivation should be flat and continued late into the season. Thick spacing helps in shading out weeds after "lay-by" time. We are demonstrating a rotary hoe and front and rear mounted cultivators. The last cultivator is equipped with an anhydrous ammonia applicator. Cotton in this area requires considerable amounts of nitrogen; and anhydrous ammonia is a very economical source, applied before planting or as a side dressing.

6. Insect Control and Defoliation

Good insect control is necessary for high yields and sound bolls. Defoliation causes the cotton to open in a relatively short time, prevents lint discoloration from leaf stains and reduces the leaf trash harvested with the cotton. Both dusters and sprayers have proved satisfactory for insect control and defoliation.

Although dusters are most commonly used in this area, sprayers could be used to a good advantage. The first machine is an eight-row duster. The next is a six-row sprayer equipped with wheel and axle shields. We consider it important to use wheel shields and to cover as many rows as possible to reduce damage to the cotton, especially during the late season poisoning and defoliating.

Airplane dusters and sprayers also are being displayed.

7. Harvesting

The final phase of this demonstration is mechanical cotton harvesting. It has not been accepted rapidly in this area due to two factors: lack of machines adaptable to our farming practices and conditions, and failure of farmers to change to production practices adaptable to machine harvesters. However, in recent years encouraging trends have been the design of smaller and lower cost harvesters and the realization by farmers that cotton production must be adapted to machine harvesting. Mechanical cotton harvesters were successfully used throughout Alabama this year.

The first cotton harvester shown is one of several steel roll strippers on the market. While this machine is doing a satisfactory job here, it has not proved satisfactory in harvesting the large, bushy-type cotton that we often grow.

The next machine uses brushes to brush the cotton from the plants. Here again, the condition of the cotton determines to a large extent the degree of success of the machine.

The third machine uses fingers to strip the cotton from the plant. It pulls the bolls in a manner similar to hand snapping.

The next two machines are small, one-row spindle pickers that are gaining popularity in Alabama. Where the cotton is grown for mechanical harvesters, these two machines have been quite successful.

The next two machines are the large two-row spindle pickers.

4 GOOD REASONS FOR USING

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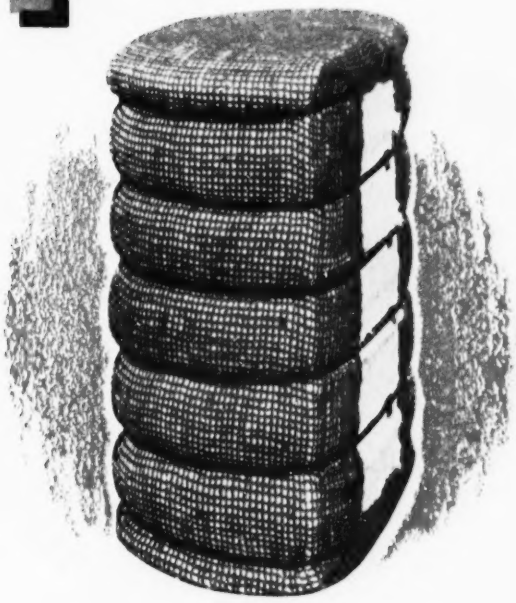

EXTRA STRENGTH

Carolina Jute Bagging is extra strong . . . tested for uniformity. Full yardage and full weight is guaranteed.

TAKES ROUGH HANDLING

Stands up well under rough handling . . . protects cotton both in storage and during shipment.

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Cotton is subject to less weather damage than that covered with closely woven cloth.

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Open weave admits sunlight and air . . . keeps cotton dry and in good condition. Looks better after cutting sample holes.

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MANUFACTURERS OF BAGGING AND TIES

Mechanization Challenge

(Continued from Page 33)

Cotton even competes with the lowly worm—the silk worm.

Cotton has animal competitors in sheep, llamas, camels and several other wool and hair producers.

Cotton competes even with birds in challenging feathers as the proper stuffing for furniture, beds, mattresses, etc.

Cotton, is, or can be, sucessfully raised at low cost in many other lands where an elevated standard of living is not an immediate challenge; but **this** points out that the real challenge of cotton mechanization to our industry is that of helping lift tremendous burdens of labor from the backs of fellow human beings everywhere.

What I have just said about the competition of other things with cotton points out that the complete mechanization of cotton production—planting, fertilizing, cultivating, and harvesting—is an immediate economic necessity. Production costs must be reduced by mechanization if cotton as a crop is to make progress.

What can we as industry do to help solve cotton's problems? We seek your suggestions.

Let's look at what our industry has done.

Almost all the major companies and many smaller ones make plowing, planting and cultivating equipment for cotton. Many produce stalk cutters and other specialized tools. This has been going on successfully for many years and good progress continues to be made.

The harvesting of cotton presents tough problems, but even so, practically every major company in our industry is now producing a cotton harvesting unit of some kind or is working on such a machine. Some companies are working strippers, others emphasize pickers; and our company has done some serious work in trying to adapt our harvesters to cotton harvesting. Who knows, maybe a "combine" of some kind is the answer.

This much is certain—the farm machinery industry has invested millions upon millions of dollars in engineering, in research, in field testing, in market anlyses, in improved service and educational programs. The details of these programs are so complete that all of you must be familiar with them.

What our industry really needs is more facts from the expanded research work of our colleges and universities. We know that the colleges, universities and USDA are anxious to cooperate with us, so this is only a confirmation of what they already know, and are willing to do, but this is also a plea for quicker action when facts that pertain to or affect cotton production or harvesting become known.

We need to know if check-rowing cotton is ever to be seriously considered again. Is the necessity of seed conservation likely to be a future possibility?

Many in our industry would like to know if machine blocking of cotton is practical everywhere.

What, if any, is the effect of flame cultivation on the crop—on the land? Should it be encouraged? Should it be continued?

Where is it necessary to plant cotton on the contour—what kind of equipment changes are needed?

How should cotton be fertilized and with what kind of machines?

Should all cotton eventually be defoliated before harvesting or is it necessary?

How clean should cotton be, or how full of leaves, stems, etc., could it be without affecting the efficiency of ginning, fabric making, and oil extracting operations?

These may seem like rather simple questions, but the answers are apparently not easy. The questions I've asked are fundamental—and some fundamental research is necessary to give our industry the right answers.

To repeat, it is my belief that our educational, research, and governmental agencies should give our industy more facts, more quickly. We should be given certain ideas that may come from research even before they're proved, so that more than one group could be given an opportunity to work on such projects.

For fear that you may think me entirely critical, let me pause to say thank you to the folks in research at the experiment stations and at universities for keeping ahead of most of the rapidly changing phases of farming in the South. My point is that whatever affects cotton also affects all other aspects of agriculture, and a quick moving program of cooperation between research, industry, and farmers is essential for the good of all—particularly Southern agriculture.

For example, corn may some day be king where cotton now reigns. Corn can move south, but right now cotton can't move north very far. Cotton farmers are interested in many other kinds of farming in various places. Other crops are competing with cotton in land use everywhere in the South, Southwest, and in California. Facts about this may affect the future of cotton mechanization, and our industry should be informed on all changes in cropland use. This is so because our industry's first obligation is to make the machines that our farmers need to increase production and lower costs while maintaining the producing power of the land.

The tractor, and certain self-propelled units, have lifted the burden of labor from the backs of humans and animals. With these we brought the benefits of power farming to large and medium sized family farms. Production costs have been reduced. Farmers have become businessmen.

Now, we stand ready to bring similar advancements to many smaller farms. There need be no great changes hurriedly made, but there will be an immediate need for close, well integrated cooperation between farmers themselves, between farmers and dealers, and between dealers and manufacturers.

This we know: cotton calls for mechanization because its production and harvesting costs in man hours must be reduced. It must be reduced if it is to compete with other products used for the same purposes. Our industry stands ready to help—what can we do for you? How can we help? We're ready, willing, and able.

To me it looks as if the next few years will determine what happens to King Cotton in the South. I think we can continue to make progress in power farming in the Southern cotton fields if we all cooperate willingly. If we do this we'll have a bright future and so will the South. The size of the Southern farm and the most efficient type of mechanized cotton production techniques are bound to get together.

Maybe our industry can help increase the productivity of each worker used in producing cotton?

Maybe our industry can help increase the income of each person employed in producing cotton?

Maybe small farmers will have to join together in purchasing modern machinery?

We can't give you all the answers here or now; but if you'll recommend what methods should be used, our industry will no doubt have those men available who are willing to work out the problems of standardization of procedures, and in the development of needed machines.

Presenting

J. Howard Fox

Hearne, Texas

J. HOWARD FOX, Hearne, Texas, 1952-53 president of the Texas Cottonseed Crushers' Association and manager of South Texas Cotton Oil Co. at Hearne, was born March 7, 1907, at Granger, Texas.

Fox was awarded the B. A. degree from Southwestern University, Georgetown, Texas, in 1928, and he entered the oil mill business in July of that year as a seed weigher at Corpus Christi, Texas. In 1929 he was transferred to the Hearne mill as cashier. It was in 1943 that Fox was named manager of the mill.

The Hearne man was vice-president of the Texas crushers in 1952-53 and has served that group as a director and on committees. He is a member of the Hearne Rotary Club and of the Methodist Church, where he was chairman of the board of stewards for eight years. Fox has been a director of the Brazos River Conservation and Reclamation District and the Hearne Chamber of Commerce. He also served his community as city alderman for four years.

Fox is married and has three daughters, Helen, Betty and Susan.

(Continued from Page 10)

machine has largely displaced hand harvest, the gins have been quick to meet the new condition through the installation of equipment specially designed for ginning mechanically harvested cotton, whether stripped or spindle picked.

In some sections of the Southeast this year, where unexpectedly large numbers of mechanical pickers were put into operation, gins for the first time had to do in a few short weeks what they were accustomed to do in a three-to-six-month period.

To handle adequately the crop under such conditions, it was pointed out, the ginner must (1) increase his storage space, or (2) enlarge his plant capacity. This, however, is not a problem peculiar to the Southeast; ginners in many other sections of the Belt face the same hard choice.

A highlight of the Conference was the field demonstration Oct. 30 at the Sand Mountain substation. Following opening remarks by F. A. Kummer, head of the API agricultural engineering department at Auburn, station personnel described their adaptability to Southeastern conditions as machines for cover crop seeding, crop residue disposal, seedbed preparation, planting, weed control, insect control, defoliation and harvesting were demonstrated.

Confidence was expressed by conference speakers, and this confidence was reflected in the enthusiastic interest in the Sand Mountain demonstration, that a way will be found to extend the benefits of full mechanization to the smaller farms of the Belt. This can be accomplished through continued research aimed at lower-cost machinery engineered to meet the needs of the smaller farm, and further advances in precision planting, fertilizer application, weed control, cultivation, defoliation and other cotton production practices.

Other features of the Conference included a tour of the Gadsden plant of the Allis-Chalmers Manufacturing Co., where that company's spindle pickers are made, and a barbecue lunch provided by A-C; a buffet dinner Oct. 28 at the Gadsden Country Club, with Gadsden's First National Bank as host; and the annual banquet Oct. 29 at the Municipal Auditorium. Toastmaster at the banquet was Wm. J. Fisher, vice-president of the Oliver Corp. and president in 1952-53 of the Farm Equipment Institute. Principal speaker was Hugh M. Comer, board chairman of Avondale Mills, Sylacauga, Ala.

The conference delegates were served a barbecue lunch at the Sand Mountain substation, in connection with the field demonstration.

General chairman of the Conference was R. Flake Shaw, chairman of the National Cotton Council's Mechanization Steering Committee and executive vice-president of the North Carolina Farm Bureau Federation. J. D. Hays, Jr., vice-president of the Alabama Farm Bureau Federation, presided at the first day's session and led one of the panel discussions the second day; presiding the second day was Charles W. Shepard, Gadsden cotton merchant and chairman of the National Cotton Council's Sales Promotion Committee. General Conference Chairman Shaw presided at the final session Oct. 30 at the Sand Mountain substation.

The Conference was sponsored by the National Cotton Council in cooperation with Alabama Polytechnic Institute, U.S. Department of Agriculture, Farm Equipment Institute and Cotton Belt agricultural colleges.

Palm Oil, Kernel Output Increases in Malaya

Production of palm oil and palm kernels in Malaya during the first six months of 1953 exceeded production for the same period last year by about one-fourth, USDA states.

Palm oil production totaled 26,574 short tons and palm kernel output was 6,899 tons for the period. Increases were attributed to the gradual increase in acreage and better collections from acres harvested.

Stocks of palm oil and palm kernels as of June 30 were reported at 7,222 and 1,617 tons, respectively. Exports of oil during the period this year amounted to 24,763 tons tons against 25,342 tons in the same months in 1952. A total of 6,679 tons of kernels was exported as compared with 6,170 tons the year before.

Major market for palm oil traditionally has been Great Britain, but this year Indian demand has been strong. Germany and the Netherlands were the major markets for kernels. Prices for both palm oil and kernels have been trending downward in 1953.

New Booklet:

CHIPMAN CHEMICAL CO. ISSUES WEED CONTROL PUBLICATION

An up-to-date revision of a booklet, You Can't Argue with Weeds, has just been issued by Chipman Chemical Co., manufacturers of chemical weed killers since 1912. This 40-page booklet contains information on a wide variety of chemicals currently recommended for weed, grass and brush control—explaining what they are, what they are used for and how to use them. In addition, many pages are devoted to illustrations and detailed descriptions of the most troublesome weeds, as well as specific directions for their control. Considerable information on killing brush, trees and stumps is also included.

A copy of You Can't Argue with Weeds may be obtained without obligation by writing to Chipman Chemical Co., Inc., Department 22, Bound Brook, N. J.; or to The Cotton Gin and Oil Mill Press, P.O. Box 444, Dallas 21.

Poultry Outlook Good

Another good year for poultry raisers in 1954 is forecast by USDA. Gross income from poultry and eggs is expected to be around $4 billion, or about the same as in 1953.

Broiler production probably will show a small increase next year, USDA says, and a slightly larger egg production next spring is indicated.

• Oil Meal Recommended As Feed Supplement

SEVERAL EXTENSION Service specialists have reminded farmers recently that oil meals provide an inexpensive protein supplement for their livestock.

In Texas, Uel D. Thompson, animal husbandman, says, "One of the best ways producers can beat the cost-price squeeze is to continue feeding oil meal products as a source of supplemental protein."

Pete Turnham, Alabama Extension Service assistant dairyman, recommends cottonseed hulls mixed with molasses for dairy farmers who have some hay and silage available, but need additional roughage.

"This feed mixture can be bought in sacks for around $26 per ton," he points out. "Total digestible nutrients in the mixture cost only about three cents, as compared with five cents in good mixed hay at $50 a ton or in grain costing $70 per ton."

In Mississippi, Paul F. Newell, Extension animal husbandman, warns that "it is doubtful if some cattle will get through the winter unless the available roughages are fortified with a reasonable amount of high protein feed."

Newell points out that cottonseed meal or cake, or soybean oil meal or cake, will greatly increase the efficiency of low quality roughages.

E. E. Grissom, Extension associate animal husbandman in Mississippi, says that cottonseed meal will be valuable in getting sheep through the winter, also. "Protein feed will be needed badly from now until grazing is available," he says. "Give one pound of cottonseed meal or its equivalent to three or four ewes each day."

• Electric Power Used On Farms in 1898

INTEREST in possibilities of using electricity on farms antedated Edison's invention of the lamp, but the first practical use of electricity by agriculture probably was about 1898. Walter H. Sammis, president, Edison Electric Institute, told the National Farm Electrification Conference in Washington on Oct. 27 that electricity was used to pump irrigation water in California in 1898.

In 1910 electricity was being distributed to farmers in New York, and a committee on electricity in rural districts was appointed by the National Electric Light Association.

After reviewing progress in rural use of electricity, Sammis declared that the electricity on the average farm has hardly scratched the surface of potential uses. While widest use of electricity is in the farm home, he said that greatest potential for future expansion is offered by the farm chore load.

Drouth Hurting Alabama

Alabama Agriculture Commissioner Frank Stewart reports that drouth the past two months has caused millions of dollars of damage to fall pastures. Stewart said that it will be months before cattlemen and dairymen recover from the setback. He added that the Black Belt and Tennessee Valley areas were hardest hit.

Mechanization Conference Report

Alabama Cotton and Mechanization

By Dr. E. V. SMITH

■ Address at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

BEFORE GETTING into the subject of Cotton and Mechanization in Alabama, I would like to give you some background on our state's geology, topography, and soil make-up, its agricultural history, and its farm organization.

In the extreme south, Alabama touches the Gulf of Mexico. Approximately the southern third of the state is known as the Lower Coastal Plain and is of marine origin. The soils are predominantly gray or red loamy sands to sandy loams. The area ranges from nearly level to rolling with elevations from sea level to to 400 or 500 feet. Just north of the Lower Coastal Plain lies the Black Belt. This crescent-shaped region, which lies partly in Mississippi, extends eastward about three-fourths of the way across Alabama. Like the Coastal Plains, it is of marine origin; its elevation ranges from 200 to 300 feet; its topography is nearly level; its soils are typically heavy clays which vary from almost pure limestone to very acid clays. Contiguous with the Black Belt on the north and extending along the western edge of the state is the Upper Coastal Plain. The elevation ranges up to 1,000 feet in the north and much of the area has a rough, broken topography. The surface soils are mostly gray, fine sandy loams.

The Piedmont Plateau enters Alabama from Georgia in the east-central section and represents the state's oldest geological formation. Its topography is rolling to hilly; its soils are red sandy loams to clay loams and have been severely eroded; its elevation varies from 700 to 1,000 feet. North of the Piedmont Plateau and east of the Upper Coastal Plain is the Appalachian Plateau that consists of a number of mountains extending in a general northeasterly-southwesterly direction. Many of the steeper slopes are non-agricultural. The better agricultural areas are derived from sandstones and, as might be anticipated, the soils are sands and sandy loams. This fact has given rise to the region's common name, "Sand Mountain." The topography varies from rugged mountains to gently rolling plateaus and the elevation of the agricultural regions ranges to more than 1,000 feet. A number of limestone valleys lie in northern Alabama, of which the larger and better known are the Tennessee and Coosa River Valleys. The soils are fairly heavy and of limestone derivation; the better ones are red in color and are of relatively high inherent fertility.

In general, the first settlements were established along the navigable rivers. As a consequence, these areas were also among the first to be developed for agricultural purposes. Similarly, other regions of relatively level topography were settled early. In sections such as the Tennessee Valley, the Black Belt, and parts of the Lower Coastal Plain with good accessibility to navigable streams and with more or less level topography, an agriculture based on the plantation system developed prior to the "War Between the States." The hillier sections of the state were settled later, and, largely because of topography, the pattern of farm organization tended toward the family farm rather than the multiple unit plantation.

Dr. E. V. SMITH is Dean and Director, School of Agriculture and Alabama Agricultural Experiment Station, Alabama Polytechnic Institute, Auburn.

Alabama is more or less typical of the eastern hilly land portion of the Cotton Belt in that its economy developed largely as an agricultural economy. Despite the diversity of farm organization, the average sized farm was small and farm population made up a high percentage of the total population; as late as 1940, farm population constituted 47 percent of the total.

Cotton soon became the state's major cash crop. Plantations were developed in the large river terrace areas and later in the Black Belt because of the suitability of the terrain to large scale cotton production. Small farmers also grew cotton as their principal cash crop; as a matter of record, almost every community had an established cotton market, but real markets for other products were usually non-existent. In many counties, country traders provided the only market for livestock. Corn was grown as a subsistence feed crop for the workstock and meat animals and for food for the farm family. Pastures were largely abandoned cropland or at best were unimproved.

This background should help to explain why Alabama, along with other Southern states, lagged behind most other agricultural regions in mechanizing its farm operations. To begin with, large land owners were reluctant to upset an organizational pattern and displace farm workers, many of whose ancestors had lived on the same plantation through a number of generations; similarly, they were reluctant to make the large capital investments needed to replace mules and mule drawn equipment with tractors and tractor equipment. Small farmers, on the other hand, were unable to change from mules to tractors when their only source of cash income came from five to 10 acres of cotton. Furthermore, tractors and harvesting equipment that had been developed for the large, relatively level fields of the Corn Belt were not adapted to the rolling to hilly terrain that characterizes much of the states' area. Similarly, such tractors provided more power than was needed on the sandy soils of a number of sections of the state, and, consequently, were too expensive. For reasons such as these there were only 7,638 tractors on Alabama farms in 1940, and few pieces of mechanical harvesting equipment.

Mechanization of Alabama's agriculture has proceeded rapidly since about 1940. Many factors, some beginning much before 1940, have contributed to this progress. Strange as it may seem, the boll weevil was an early contributor. The Black Belt, which had been one of the state's major cotton producing areas, was hard hit by this pest soon after it arrived in the middle teens. Due to the disastrous ravages of the boll weevil, farmers on the heavy clay lands were forced to seek other principal sources of farm income. Research results obtained at the Black Belt Experiment Substation pointed the way to a livestock economy for the Black Belt based on a grassland agriculture. This shift in emphasis indicated a need for power for putting in feed crops and for hay making that resulted in rapid mechanization.

No other section of the state suffered so seriously from the boll weevil. But the weevil's appearance, plus the agricultural depression which began in the early twenties, caused farm leaders to stop and take stock of Alabama's total agricultural resources and production potential. They found that the cotton acreage, which ranged from 2.5 to 3.5 million acres during the decade beginning in 1920, was equalled by the subsistence crop, corn, and that there was about as much additional land classified as crop and pasture land as there was devoted to cotton and corn. Although cotton occupied no more than one-fourth of the crop and pasture land, it provided a major portion of the state's cash farm income. Some of the far-sighted farm leaders of that day felt that this other three-fourths of the farmers' land would have to be made to produce its fair share of income. Without neglecting

cotton, the experiment station system began in the early 1930's a broad program of research on pastures and pasture fertilization, on perennial legumes for grazing and hay, and on winter grazing crops, all pointing toward the development of a livestock program that would utilize the additional land and supplement the income from cotton. Results of the research were encouraging.

It soon became apparent, however, that farmers needed power that could be supplied only by tractor equipment. Power needs for turning acreages of winter legumes, for harvesting hay and other forages, and the time element involved in meeting these needs, all accentuated the importance of mechanization. Thus, the addition of livestock, which expanded the proportion of the total crop and pasture land in commercial agriculture, should be considered a second major factor contributing to the mechanization of the state's agriculture. The small farmer who could not afford a tractor to work his cotton acreage alone frequently found that he could not afford to be without a tractor when he added livestock to cotton.

Military demands for manpower during World War II and the great opportunities for industrial and other off-farm employment during and after the war caused a great migration of people away from the farm. It will be remembered that farm population in Alabama in 1940 amounted to 47 percent of the total population; by 1950, it had dropped to 31 percent. This factor, more than any other, coupled with a period of high demand for farm products at good prices, accounts for the rapid rise in farm mechanization in the last decade. Plantation owners who had been loath to replace farm workers and mule power with tractor power, were forced to make the transition as the result of the voluntary migration. The movement of people away from farms had a similar but lesser effect on the mechanization of small farms. An interesting partial result of rapid mechanization during the last decade has been a change in the farmers' attitude toward corn. As the tractor replaced the mule, the farmer was faced with the necessity of using more productively a considerable portion of the 3¼ million acres of land that he had formerly used for the production of subsistence corn. Results of research that had produced adapted Southern hybrid corns and that had shown the importance of thick spacing and high nitrogen fertilization, were quickly accepted by the farmer. Although practically no hybrid corn was planted in 1940 in Alabama, almost 50 percent was planted to adapted hybrids in 1953 and some county agents on Sand Mountain will tell you their crops are 100 percent hybrid. This has meant a 100 percent increase in per acre yields of a crop adapted to full mechanization and has contributed to an expanding hog and poultry production program.

The farm machinery industry has contributed to the state's advance in mechanization. The industry has developed tractors and equipment adapted to our various terrains and soils. In addition to conventional harvesters, manufacturers have designed and put into production harvesters for special Southern crops such as peanuts and cotton.

As the result of all of these contributing factors, the number of tractors on Alabama farms has increased from 7,600 in 1941 to more than 50,000 this year and there are as many combines, corn pickers, and pick-up balers now as there were tractors in 1941. Since cotton is still an important source of cash income in Alabama, the specific question of mechanization of cotton production and harvesting may properly be raised. The use of tractor equipment for land preparation, planting, and cultivation is common, even on small farms. Beyond these basic operations, however, the use of additional mechanization techniques is at present limited mostly to larger farms. For example, S. E. Gissendanner, superintendent of the Sand Mountain Substation, told me that he considered the rotary hoe to be one of the most valuable pieces of tractor equipment for use in cotton production. He stated, however, that very few farmers on Sand Mountain use rotary hoes. Since the average cotton acreage per farm in this area in 1952 was less than eight acres, the adoption of this relatively simple equipment may be dependent upon what other crops the farmer can use it on.

Although there were few mechanical cotton harvesters of any type in Alabama a few years ago, they are coming into widespread use on larger farms in the more level areas of the state. Such reports as these are common this year: "A dealer in a north Alabama town sold five spindle-type pickers in one day" . . . "We sold three brush-type harvesters yesterday" . . . "We have three pickers in our field today."

Our agricultural engineers, working at the Sand Mountain substation, have shown the feasibility of mechanical harvesting on rolling land when proper land preparation and cultivation have been employed. A high level of farm income, opportunities for off-farm employment, and further technological advances which might lower the initial cost of harvesters might well extend mechanical harvesting to small hilly farms. Few people ever expected to see corn custom picked on Sand Mountain, yet many custom pickers were at work in the area this season. Is it more unreasonable to believe that custom harvesting of cotton will come?

Glenn W. King Co. Is Texas Representative of Eriez

R. A. Roosevelt, sales manager of Eriez Manufacturing Co., Erie, Pa., has announced the appointment of the Glenn W. King Co., Houston, as exclusive sales representative for the entire state of Texas.

King, a graduate of Rice Institute, has associated with him F. C. Samp, a

GLENN W. KING

graduate engineer from Kansas State College. Both have represented Eriez, the world's largest exclusive producers of permanent non-electric magnetic equipment, in the Houston area for a number of years. King is now establishing industrial distributor arrangements in key market areas throughout the state.

The Glenn W. King Co. is located at 4101 San Jacinto Street, Houston.

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Progress and Problems in Mechanizing

(Continued from Page 28)

acceptable in the loan program this year. Every available means should be used to produce cotton clean and keep it clean. That may require a combination of practices involving the use of pre- and post-emergence chemicals, sweeps, flames and hand hoeing. Recently I was on a cotton plantation in our upper Coastal Plains where hand work was limited to thinning or chopping. This could have been done by a mechanical chopper with some sacrifice of stand. Cultivation started with a rotary hoe when the first seed started to germinate and was continued until it was big enough to be plowed with sweeps. From then on it was cultivated at frequent intervals with sweeps. It was entirely free of crab grass and practically free of all grass and weeds. A mechanical picker was doing an excellent job of harvesting this cotton which graded very high. The total cost of producing this crop which yielded in excess of a bale per acre was $39 exclusive of land rental and harvesting charges. Unusual? Yes. But it was done and may be repeated. The owner of this farm and his brother bought the picker together. Next year they expect to buy another.

This is the first year mechanical cotton harvesters have come into their own in the Southeast. The figures are not available on the total number of machines in use this year, but the demand for pickers in the smaller sizes has been great. This is the first year that small pickers have been available in appreciable quantity and farmer acceptance has undoubtedly been gratifying to manufacturers. A comparatively good crop, combined with difficult to hire and expensive labor, the ever-present threat of tropical storms in the Coastal Plains and the determination of farmers to mechanize all the way, has placed mechanical harvesting on the soundest foundation attained thus far. The Charlotte district office of International Harvester Co., which serves North Carolina, minus 10 northwestern counties, and all but eight southwestern counties of South Carolina, reported on Sept. 16 that, "To date we have shipped 186 pickers (138 C-14, 18 H-14, and 30 M-14) to dealers. The retail activity of our dealers on cotton pickers is exceptionally good and pickers are being delivered daily. Our latest count is 175 delivered retail and the remainder should be in the hands of users in the next few days." Figures on other makes were not available, but one-row spindle pickers have been much in demand. I am sure manufacturers realize that the future market for mechanical cotton harvesters lies in the South. It has been reported that more than 70 percent of California's 1952 crop was harvested by machines. That doesn't leave much but a replacement market. Give our farmers low cost, dependable machines, designed to meet the conditions of this area, and rapid progress will be made in mechanizing the cotton harvest.

Much has been said about irrigation in the Southeast and more will be heard on the subject. Irrigation is gaining a firm foothold throughout the area. It proved its worth in the production of vegetables many years ago, but only recently have such crops as corn, tobacco and cotton been irrigated. W. P. Law, associate agricultural engineer of the South Carolina Experiment Station, conducted a survey of all known cotton irrigators in the humid area in the fall of 1952. These included experiment stations of five Southeastern states as well as several South Carolina farmers, according to Mr. Law:

"Reports of 23 experiences with irrigated cotton were received, showing an average increase over unirrigated check plantings of 0.51 bales per acre for the period 1947-1952. The seven reports on yields for 1952 averaged 0.85 bales per acre increase, while those for the other years averaged 0.31 bales per acre.

"Contrary to general opinion, several growers reported less second growth and better defoliation on their irrigated cotton. These desirable effects of irrigating cotton were noted this year in an experiment at Clemson.

"Where conditions are favorable for irrigation and at present cotton prices, it is estimated that a yield-increase of 0.51 bales per acre would return two to four times the cost of irrigation."

Corn yields have been increased an average of 44 bushels per acre during the seven year period, 1946-1952, in tests conducted at Clemson. The average net return per acre was $66.76 based on South Carolina market prices at time of harvest.

Tobacco and many other crops are being irrigated profitably throughout the Southeast.

Progress is accompanied by problems and we face many varied and complex problems in the mechanization of our agriculture. Those that seem most important at this time follow:

1. **Land Development for Mechanized Farming**—The late W. E. Meek frequently referred to power farming as being precision farming. Precision farming is an objective in power farming but it is difficult to attain in the presence of rocks, gullies, stumps, poor terraces, etc. We have adopted labor-saving machines at such a rapid rate there has not been time to get the land in shape for their proper use. Recently I inspected a combine cylinder that had been used a few hours in harvesting a low-growing crop. The shaft and all of the bars were bent beyond repair. The cost of the parts and the time required to repair the cylinder would have gone a long way toward removing the rocks responsible for the breakdown. Cotton pickers are precision built to do precision work. The thud of a rock and all the accompanying noises of a rock going through the spindles of a cotton picker are distressing. It means the loss of time and great expense in replacing damaged parts. In the coastal area pine knots, discarded sweeps, plow shares, and many other foreign objects substitute for the rocks of the Piedmont. Old fence lines, turn strips and other irregularites should be leveled out. Bermuda grass, Johnson grass and many other perennial grasses should be eradicated prior to planting row crops. This can be done with the right tools by taking advantage of weather conditions. Removing rocks is not such an easy job. Generations of farmers have been picking up rocks and plenty are left for the present and future generations. They can be removed and must be for the satisfactory performance of many implements. There are some stone pickers on the market and a lot of thought is being given to the problem.

More care must be exercised in terracing. Preparing the land for terracing is important in the elimination of hairpin turns and other undesirable conditions. The Alabama Station has given considerable attention to this problem.

Turning is expensive and time consuming. Farms in all areas of the Southeast should be re-arranged to make fields as big as practicable.

2. **Complete vs. Partial Mechanization**—Farmers are reluctant to go all the

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way in mechanizing crop production. The farmer who has relied entirely on mule power will not give up all the mules immediately when he turns to tractor power. They are kept around to plant and cultivate until he is convinced that tractor planting and cultivating are practical. The mules must eat daily and they soon become expensive loafing relics of yesteryear.

J. H. Arnett, agricultural engineer of Coker's Pedigreed Seed Co., produced 25 acres of cotton in 1952 at a cost of 23.89 cents per pound. Practices included chemical weed control, flame cultivation and mechanical harvesting. The yield averaged 452 pounds of lint per acre. He calculated that the cost per pound could have been reduced to 21.7 cents if the yield had averaged 500 pounds of lint per acre. Conventional production costs were as high as 32 cents per pound.

In 1953 he supervised a mechanization test of 100 acres. Some production costs were reduced over the previous year but it was necessary to spend $8 per acre for hand hoeing. The crop which averaged 550 pounds of lint per acre was produced for approximately 19 cents per pound.

In commenting on his production experience Mr. Arnett stated, "Complete mechanization offers an opportunity for better management and at the same time demands it. Proper supervision is a must if the farmer is to succeed in performing the operations that will lead to grass-free fields of cotton which will yield 500 pounds or more of lint per acre. Proper land selection, proper rotation, proper cultivation, good insect control, irrigation and other helpful practices are more important now than ever."

3. **Weed Control in Cotton**—Reference has been made to the grass and weed problem. Because it is such a problem it bears repeating. Engineers, agronomists, chemists and all concerned must work to produce cotton free of grass, particularly crab grass. Techniques are known for producing cotton clean and without resorting to hand operations. They are not fool-proof under certain weather conditions and that is why the problem is so complex. Farmers are hesitant to plan for complete mechanization when it may be necessary to hire hoe hands.

4. **Defoliation** — Defoliation was conceived to admit light into rank cotton and reduce boll rot. The practice of defoliation preceded mechanical harvesting in some areas of the Cotton Belt and now it is a necessity wherever cotton is harvested with machines. There is much to be desired of defoliants. We have been dependent upon dust in the Southeast which must be applied when the cotton plants are wet with dew and the air is still. When conditions are favorable, good defoliation results. Some spray materials which may be applied under less restricted conditions look promising. Second growth is the greatest problem. This year the growing season was unusually dry and rains followed defoliation in much of the Southeast. The second growth greatly interfered with mechanical harvesting and was responsible for staining the fiber and lowering the grade.

5. **Ginning**—Most of our gins are not equipped to handle rough harvested cotton. Some that are well equipped are not properly operated to give the best samples. Our ginners' associations, Extension Services and manufacturers of gin equipment are doing a lot to improve ginning. These agencies need the cooperation of all individuals and organizations interested in cotton if we are to supply mills with a good product.

6. **Irrigation**—The Southeast is blessed with good water. Our high annual rainfall and thousands of streams are the envy of people in other parts of the world and nation. The high investment in crop production, regularity of drouths and low water holding capacity of our soils have brought about an interest in irrigation. Sometimes we have failed to recognize, however, that water is not so plentiful when demands from industry, municipalities and farmers are combined. The problem of conserving water is one which the farmer must recognize if irrigation is to become a general practice.

The Southeast, once considered a problem area, has become an opportunity area. Those who know the Southeast are much impressed with the progress that has been made in recent years. Farms, factories and people radiate the progress that is transforming the Southeast into one of the leading sections of the nation.

• Weight Variations In Bales Studied

VARIATIONS in cotton bale weights during the 1951-52 and 1952-53 seasons are the subject of a report from USDA's cotton branch. The study, made possible by the cooperation of ginners, shows that eight percent of ginnings in 1951-52 and six percent in 1952-53 either weighed 400 pounds or less or more than 600 pounds.

Last season, the report shows, 30.5 percent of the bales weighed 451 to 500 pounds and 39.9 percent weighed 501 to 550 pounds. Percentages included 0.8 percent weighing 350 pounds or less, 2.1 percent 351 to 400 pounds, and 9.6 percent 401 to 450 pounds. Overweight bales included 13.9 percent weighing 551 to 600 pounds, 2.6 percent 601 to 650, and 0.6 percent weighing over 650 pounds.

Ginners are reminded, in the report, that both lightweight bales and extra-heavy bales have many disadvantages that should cause ginners to make every effort to avoid extremes in weight.

Young Lady Likes Grandpa's Cotton

HAPPILY PERCHED atop a trailer full of cotton is Brenda Carroll Chancellor, granddaughter of Clifton Walker, Laurel, Miss., cotton farmer. Brenda's grandfather had a 1953 production of 20 bales of cotton from 14 acres. The photograph of this appealing young miss was made by W. S. Granberry, Laurel Oil & Fertilizer Co.

Three at Hercules Powder Get Highest Navy Award

Distinguished Public Service Awards have been presented to three research scientists associated with Hercules Powder Co., Wilmington, Del.

They are Dr. Lyman G. Bonner, technical director of the rocket development department at Allegany, N.Y.; Dr. Ralph F. Precknel, a research group supervisor; and Richard Winer, chief of the rocket development department.

The awards were given for "exceptional contributions to the United States Navy." The award, which is the highest Navy civilian award, credited the trio with making "a major contribution to the field of propulsion by developing new propellants which make possible the use of guided missiles, rockets and JATO, over a much wider temperature range."

4-H Achievement Day

Nov. 14 is National 4-H Achievement Day during which recognition will be given to the importance of 4-H work to rural young people.

Mechanization Conference Report

The Mechanization Road Ahead

By C. G. PEARSE

■ Address at Seventh Annual Cotton Mechanization Conference, Gadsden, Ala., Oct. 28-30, 1953.

THE SOUTHEAST, along with the rest of the Cotton Belt, has gone a long way in its mechanization of agriculture.

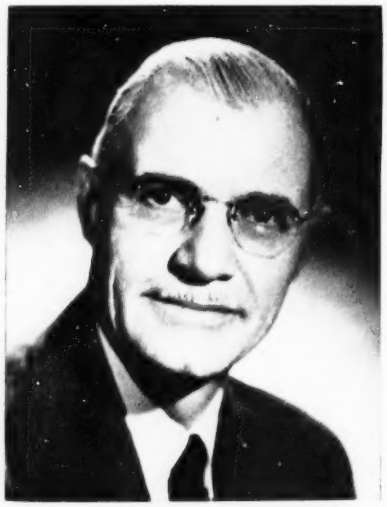
Perhaps one of the best signs of the progress that has been made in the Southeast is the amount of work that is now being done by tractor power instead of animal power, as indicated both by the number of tractors on farms and the **increase** in tractor population that has occurred during the past few years.

I don't want to bore you by reviewing too many statistics during this concluding part of our conference, but I would like to use just a few to illustrate my point. In the eight principal Southeastern cotton states the number of tractors on farms has increased 411 percent between the Agricultural Census years of 1940 and 1950. During this same 10-year period, in a highly mechanized corn state such as Iowa, the increase in the number of tractors on farms has been only 81 percent, and in a mechanized wheat state such as Kansas, only 49 percent. This means that much more work is now being done with tractor power and indicates that the Southeast is definitely on its way toward complete mechanization.

As miraculous as the increase in the number of tractors on farms appears to be, we still have a long way to go. Too much of the farm work, particularly in connection with growing of cotton, still is being done by animal power and by human labor. For example, in the eight Southeastern cotton states there is an average of 19 farm people for each tractor on farms. In Iowa there are 3½ farm people per tractor and in Kansas there are only 3.

I doubt that the rate of farm people per tractor can ever be as low in the Southeast as in a state like Kansas due to the difference in crops, soil conditions, topography and size of fields. However, if we were to assume that agriculture is completely mechanized in Kansas (which of course it is not) then the Southeast is only one-sixth mechanized.

Therefore, despite the marked progress that has been made there is much room for improvement. How fast the trend will continue toward complete mechanization cannot be predicted, but of this I am sure: Progress in the future will continue at a rapid rate and agriculture will be more completely mechanized as time goes on. As in the corn and wheat states of the Midwest and West, more and more tractors and labor saving machinery will be used, and fewer people will be required on our farms to produce the cotton and other crops that are grown here.



C. G. PEARSE is Vice-President of J. I. Case Co., Racine, Wisc.

We are going to reduce the amount of hand labor, for example, that is now required in connection with thinning and weeding cotton. We are going to do this through the development and use of better seed, by precision planting and by increased use of chemical and mechanical weed control. We are also going to improve further and develop new and still more efficient cotton harvesting machinery. Finally, we are going to do a better job of educating the farmer as to the use of new chemicals and new machinery so that the fewer people that will be required will do a better job at lower cost.

This will not be accomplished by some miracle. Nor is this job going to be done by one individual, one group or one company. It is going to be brought about by the same whole-hearted cooperation that we have had in the past between all groups who have a vital interest in cotton mechanization progress. At this point I wish particularly to comment on the splendid cooperative spirit that exists between the U.S. Department of Agriculture engineers and other research people, and state experiment station workers.

It is evident that much additional research work is required both by government agencies and by private industry. The basic research work by the government agencies will determine how the job **should** be done to get the best results. Private industry—that is, the seed producers, fertilizer manufacturers, chemical producers, farm machinery manufacturers and others—will continue with their research and development work to provide the products that will make it possible to put the government research findings into actual practice.

Having the information, the materials and equipment still will not get the job done. The information with regard to the proper way of doing the job and the best use of the new materials and new machinery must be given to the farmers in such a way that they will accept it and put it to actual use. The dissemination of practical information on mechanization to each cotton grower and helping him gear that information to his individual needs will be done by our land grant colleges and universities, by our farm organizations, the National Retail Farm Equipment Association and the many thousands of farm equipment dealers located throughout the Cotton Belt.

I doubt very much that as yet full advantage is being taken of the latter group, the farm equipment dealers, in the dissemination of helpful information to the farmers. In every agricultural county there are available without cost several additional emissaries eager to assist our regular Extension workers in the spreading of valuable information to our cotton growers.

It is up to all of us in attendance at this conference to enlighten further our dealers and all other persons who are in a position to help us toward our goal of maximum mechanization.

Southern Weed Conference Jan. 11-13 in Memphis

Chemical weed control is scheduled to receive top billing during the Southern Weed Conference in Memphis, Jan. 11-13, Dr. W. B. Ennis of the Mississippi Experiment Station, conference chairman, says.

Those attending the conference will represent land grant colleges, USDA and private industry. They will review herbicide work carried out in 1953 and plan additional studies for 1954.

One feature of the conference, according to Doctor Ennis, will be an exhibit of herbicides materials and application equipment. Also, for the first time in the history of these annual meetings, a special session has been arranged for Extension Service personnel who encounter weed control problems in their work.

The meeting will be open to anyone interested in herbicidal weed control in crops and pastures.

Carolinas Ginners Will Hear Congressman

Representative Thomas Abernethy of Mississippi has accepted an invitation to address the annual convention of the Carolinas Ginners' Association Feb. 15-16 at Charlotte, N.C., Clifford H. Hardy, Bennettsville, executive secretary, has announced.

■ **MONROE MAY, Southland Feed Mills, Dallas, has been appointed on the membership and education committees of Texas Feed Manufacturers' Association.**

V. D. Anderson Co. Names Brittain Treasurer

Roy L. Brittain has been elected treasurer and director of the V. D. Anderson Co., manufacturer of vegetable oil extraction machinery and vapor and gas processing equipment, according to an announcement by Carl W. Zies, president, Cleveland.

Comptroller of the V. D. Anderson Co. since 1948, Brittain, in addition to his

ROY L. BRITTAIN

new responsibilities, will continue to head the bookkeeping, cost accounting and budgeting departments of this company, a subsidiary of Chesapeake Industries.

Brittain is considered a leading authority on accounting, credits and time studies and is the author of numerous articles on the subject of practical accounting and a frequent speaker at accounting association meetings. He is a charter member and first president of the Cleveland chapter of the National Society for Business Budgeting, a member of the Comptrollers Institute of America, and director of the Cleveland chapter of the National Association of Cost Accountants.

Samuel P. Coker Dies In Hartsville, S.C.

Samuel Pressly Coker, Hartsville, S.C., died Oct. 20 at Hartsville. He was a lifelong resident of Darlington County, having been born in Society Hill, March 12, 1887. In 1920 he organized the Humphrey-Coker Seed Co. and he also operated the S. P. Coker Gin and Hygeia Dairy.

He is survived by his widow, Mrs. Kathleen McNair Coker, three daughters, Mrs. H. W. Marvin Jr., Raleigh, N.C., Mrs. J. N. Berry, Union, Mrs. C. K. Dunlap, Jr., Hartsville, and two sons, J. Wilson Coker and S. Pressly Coker, Jr., of Hartsville and 11 grandchildren. He is also survived by five sisters, Mrs. George Tennant, Gastonia, N.C., Miss Kate Coker, Mrs. Margaret Stafford and Mrs. Harold Russell of Society Hill, and Miss Helen Coker of Seneca.

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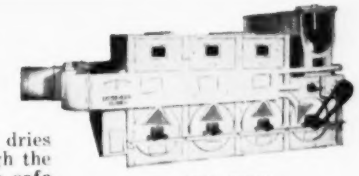

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A Realistic Look at Cotton's Future

(Continued from Page 20)

nacity rayon was severely limited by the capacity which the industry then had for the production of that particular type of fiber.

But in the crop year just past, 1952-53, all this was changed. For the first year since the 1930's, cotton derived almost none of its market from shortages of any competing materials. On both the export and the domestic market, this was true. Everywhere, we stood or fell on our ability to get markets against real competition. While some of the foreign cotton producing countries unloaded virtually all their surpluses during the year, there were others (most notably Brazil) which ended the year with surplus stocks that they had failed to sell. At home there was an abundance of everything that competes with us in large volume—burlap at half the price of the previous year, paper, and so on. There was a clear-cut surplus of rayon. Even in high-tenacity rayon, the shortage came to an end. Cotton actually sustained the loss that we had feared so much in tire cord. Today we can contemplate the fact that a surplus is accumulating even in high-tenacity rayon. Shipments have been in a down-trend since last spring. Producers' stocks have been increasing each month since April. Production, which was 100 percent of capacity in June, stood at 87 percent in September. Everywhere, the U.S. cotton industry in 1952-53 was stripped of the advantage which it had so long enjoyed through its superior ability to get production, and we battled it out purely in terms of a different challenge which had not faced us so clearly since the 1930's; namely, how to get the markets.

And how did our cotton do? On the export market, the results were disappointing. On the domestic market, the results were wonderful. First, a word about how it happened on the domestic part, and then a word about exports.

During the crop year just past—in spite of a half million bales less in tire cord, in spite of a large loss in bags, in spite of a small decline in textile exports, and in spite of the decline that we are presumed to have had in military purchases—the consumption of cotton by the spinning industry of the U.S. totaled 9.5 million bales. In spite of all the losses from the previous year which I have mentioned, mill consumption was not down at all, but up by 300,000 bales. Apparently little if any of this mill consumption found its way into net inventory accumulation, as it had in earlier years. In fact, when due allowance is made for differences in inventory accumulation and in military purchases, it appears that our consumption of 9.5 million bales of cotton in 1952-53 was the very best record we had ever made on the domestic market. In the year when we faced the hardest competitive test since the 1930's, we had the best domestic market on record.

How do we explain it? It can only be explained as the result of an immense expansion in the consumer purchases of cotton products, largely household and apparel items, an expansion amounting to something in the general neighborhood of a million bales of cotton. Some of this was the inevitable result of an increase in spendable incomes and of retail trade, but not possibly all of it. A very significant part of the gain in purchases of cotton apparel and household items was a clear-cut competitive gain at the expense of other fibers, largely rayon. We have traced the evidence of this fact in the statistics of fabric manufacture, and the evidence is genuine. We have traced it in the statistics of clothing manufacture, and the evidence is genuine. We have traced it in the trade publications and in the direct observations of many textile people, and the evidence is genuine. Cotton has made a large competitive gain at the expense of rayon. But the evidence which is most dramatic is to be found in the actual condition of the U.S. rayon industry itself. This great industry, planned and built in the anticipation that it would normally operate at full capacity, is operating today at just two-thirds of capacity. A big part of its capacity has been idle for two years. It has an idle capacity today capable of producing a quantity of fiber equal to more than a million bales of cotton a year, but it can't find the markets. It has sustained some losses to the newer synthetics, but I am convinced that its biggest losses have been to cotton.

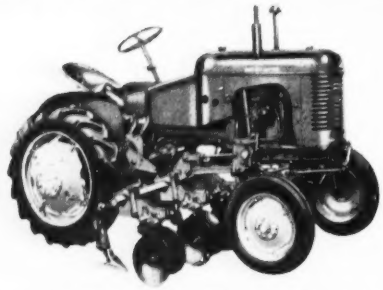
In this clear test of competitive strength, why was it that cotton did so well? It was not generally through price—quite the opposite. Back in the 1930's, when we could foresee no end to rayon's competitive gains over cotton, the price of cotton was almost never half as high as the price of rayon. But in this recent period, with the competitive trend reversed and cotton making gains against rayon in the apparel and household field, there was a fairly general price advantage on the side of rayon. Cotton turned the tide of competition in the face of a price handicap. How?

First, it was on quality—partly the inherent, long-time quality advantages of cotton over rayon—but only partly that. It was also quality in a dynamic sense. The year-to-year quality improvements of the synthetic fibers are more extensively publicized than those of cotton, but I doubt if they are as important as those of cotton. Quietly, undramatically, the quality of the cotton that comes from our fields has been **made over** since those days in the 1930's. Likewise the textile and finishing improvements in cotton products have been highly significant. Now there is steadily increasing progress and interest in chemical modifications which change the basic nature of the cotton fiber to suit specific needs. Quality improvement is and will continue to be a competitive race among the fibers. Cotton has demonstrated great stamina for that race. Its greatest progress ought to lie ahead.

The other side of our competitive strength has come through promotion. Cotton's quality is better appreciated than it used to be. As a joint result of promotion and quality improvement, there has been greater attention to the design and fabrication of cotton products—and a style trend in our favor.

In the same breath we must take full account of some things that should be troubling us. In the great, diversified market for cotton there are always things to trouble us. Our big losses in tire cord and bags carry a clear suggestion that we may be vulnerable in other industrial uses, and while these uses are not nearly so large a part of our total market as they once were, they still account for some 20 percent of it. There will be some rough competitive battles here. Also, we face increasing dangers in the field of fiber blending. The rayon industry has a lot of idle capacity in staple fiber, which can

Thin cotton this LOW COST WAY



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be mixed with cotton in the spinning process. This rayon staple today has some price advantage over cotton. How much does it change the quality of a cotton fabric to introduce a percentage of rayon into it? Possibly in some cases the difference would be slight enough or **obscure** enough, so that if the price incentive were large enough, a substantial amount of our market might go down this drain. We can also worry about the effort which the rayon industry is now making to reverse the style trend. That industry has always enjoyed a huge advantage over cotton in funds available for both research and promotion. Clearly it has recently stepped up its appropriations for both. It would be only logical to anticipate some results. I must say, however, that the latest figures which I have examined give no evidence that the results are yet forthcoming. The shipments of our entire rayon industry have declined every month since last May, and in September they were at the lowest point since April 1952.

Through all these complications, the picture which seems to emerge is this: Cotton, with the lion's share of the market, will never be free of severe competitive challenges and dangers; but cotton in 1952-53 demonstrated more clearly than ever before that it has really taken the measure of rayon competition. In the broader segment of our market, the results are to be measured not in terms of what we lost to rayon, but in terms of what rayon lost to us. Over in the future, there may be competitive swings one way or the other in any given year, but if we live up to the strength and the potentialities which are now so clearly demonstrated, the long secular advance of rayon at the expense of cotton should be at an end in this country.

Now we are not overlooking the fact that cotton has many other competitors besides rayon. But rayon holds a place of very special significance for us. Every other material in the picture is, from the standpoint of cotton's market, a specialty material. Each of those materials, because of its combination of qualities and of price, is suited to compete with cotton only in some minor fraction of its market. There is no time here to consider them individually, but taken altogether those materials do indeed challenge cotton in the great bulk of its market. Yet I say that neither singly nor collectively do these other materials raise any clear, present threat of destroying all or most of our market, such as rayon once raised. For rayon, being as close as it is to cotton in both quality and price, is the only fiber which ever raised a serious question as to whether cotton was going to survive at all with anything like the markets it had known in the past. That question was raised and was in many people's minds throughout the decade of the 1930's. The answer seemed to hang in the balance through much of the 1940's. We now seem to have the answer in the 1950's. We know that rayon is still making a great deal of technical progress, and that where research is in progress anything is possible. We know that we can still throw away our opportunities by failing to give cotton what it needs in technology, promotion, or price. But if we live up to those opportunities, we seem to have a firmer basis for confidence in a strong domestic market with the trend pointing upward (not in a single season, but over the years) than we have had in a long time.

For many years we faced a dismal parade of statistics which showed that cotton's share of the domestic textile market was going down and down. If we put cotton together with wool, rayon, and all the newer synthetics, we find cotton's percentage of the whole slipping downward through all the years from the 1920's to the middle or latter part of the 1940's. But from 1947 or '48 to the present time, that downward trend has just disappeared. There is no sign of any trend at all. Cotton has been demonstrating a new power to hold a pretty constant share of the total market. Now put with this the fact that over long periods of a decade or so there is a tendency for the per capita consumption of textile fibers to rise, even in this nation of living standards which are already high. If, over long periods of the future, we have the upward trends in both population and living standards which everyone now anticipates—and if cotton continues to hold its full share of this market as it grows—we have the basis to hope for a more dynamic rate of expansion in our domestic market than we have known since the early days of the synthetics.

Now a word about our cotton exports. Why did they drop so sharply in 1952-53?

Was it rayon competition in foreign lands? Evidently not, as a general thing.

Was it a lower rate of cotton consumption? The foreign countries of the free world consumed more cotton last season than the one before, or than any season of the recent past.

Was it the shortage of dollar exchange? No, for while this remains a problem, there was a notable easing of the problem last year compared with the earlier period.

Was it a big expansion of foreign cotton production? No; the foreign production was no greater than the year before (and by preliminary estimates it will be lower for the season now in progress).

What was it then?

With the shift which took place in the military and economic climate of the whole world, some of the net cotton consuming countries decided to reduce their raw stocks. Reacting quite naturally, a good many net producing countries developed a sudden urgency about unloading their own stocks.

They took a very substantial portion of our export market away from us, mainly by two devices: First, by a number of barter deals with importing countries; and second, by shaving prices just enough to offset the superior quality and reputation of U.S. cotton and get the market. Our export loss of 2.3 million bales was accompanied by an export gain of 1.7 million on the part of all the other cotton producers of the world.

I can only say that this series of events certainly does not signal any permanent reduction of our export market down to anything like 3.2 million bales. It presents some knotty problems which have not been solved, but wouldn't it be unrealistic to think that this cotton industry of ours, a veteran of so many knotty problems in the past, would fold up in the face of this one? I believe the problem is going to be solved, because the fundamentals are on our side. Fundamentally, our export market appears as the most dynamic and promising part of the whole picture, and the fundamentals are mainly these:

First, foreign countries have little more than half of the world's apparel fiber production, but they have 93 percent of the world's population. When poor people get enough food to eat, their next need is for more clothing. World population is increasing by some 20 millions a year. The prospects for a rising world demand for fibers over the years ahead are enormous.

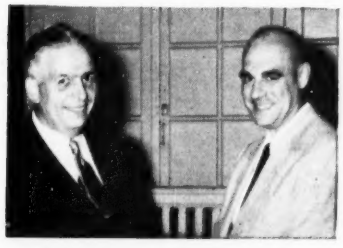
Second, the mechanical and chemical revolution in cotton production promises to bring to this country a clearer advantage over foreign producers than we have ever enjoyed before.

And third, it is good for this whole country to have a large cotton export market. It is good for our textile industry, good for our economic stability, good for our military safety, and good for the long-range preservation of our scarce resources.

Surely we need to lower our cost of production. The real cost of producing fibers of all kinds all over the world will continue trending downward, and we must stay in line or go out of business. We could have no great confidence in the future of cotton if we could not believe that our cost of production, measured by the cost of the marginal producer with a big crop, could be decidedly reduced in the years ahead.

We will need that lowered cost of production not only to keep our markets strong, but also to improve the net returns to the cotton producer. We need lower production costs not only to stay in competition for markets, but also to stay in competition for productive resources. As I have said earlier, the larger side of our problem may be, not how to get the markets, but how to get the production.

There is a growing concern about whether we can produce all the fiber we need in the next decade or two. This concern will rise and fall as the market situation rotates between scarcity and surplus, but I believe it will remain as a basic problem for the future. Sometimes we hear it expressed in terms of the limits on our land supply, with population and living standards rising as



FLEXIBLE STEEL LACING CO., Chicago, has announced the election of Milton B. Beach, left, as president and general manager. Phillip Rinaldo, right, continues as treasurer of the firm, manufacturers of belt fasteners for joining conveyor and transmission belting. John P. Ramsey was named vice-president, and Hugh L. Coats continues as secretary. Beach has been with the firm for 35 years, during 22 of which he served as vice-president. He has worked in every department and was in charge of product engineering, design, development and research before becoming president.

For the Busy Reader

MECHANIZATION COMMENTS

■ **BRIEF quotations from speeches and panel discussions during the seventh annual Beltwide Cotton Mechanization Conference, held at Gadsden, Ala., Oct. 28-30.**

SMALL FARMS TO GROW—"Through mechanization and other technological advancements, the small farm of the future will become a larger farm than the small farm of today. It will be more efficient; it will have lower costs of production, a higher productive capacity, a higher level of income, and an improved living standard."—Ben T. Lanham, Jr., Agricultural Economist, Alabama Polytechnic Institute, Auburn.

EFFECTIVE TEACHING NECESSARY—"Having the information, the materials and the equipment still will not get the job done. The information with regard to the proper way of doing the job and the best use of the new materials and new machinery must be given to the farmers in such a way that they will accept it and put it to actual use."—C. G. Pearse, Vice-President, J. I. Case Co., Racine, Wisc.

MACHINES BRING INDEPENDENCE—"Competition for farm labor has done more to speed up mechanization than any other factor. I will go a step further to say that is has done more to improve Southern agriculture than anything else. . . . Power machinery replaced farm labor and is continuing to do so. It is giving farmers business independence and the opportunity to make the most of their time."—George B. Nutt, Head, Agricultural Engineering Department, Clemson Agricultural College, Clemson, S.C.

GINS ABREAST OF TIMES—"With the selective breeding of the cotton plants most suited for mechanized processing and with the improved harvesting practices, together with the availability of improved cotton ginning machinery, the cotton ginning industry is abreast of the times and will stay so."—M. E. Pratt, President, Continental Gin Co., Birmingham, Ala.

MACHINES ONLY PART OF STORY—"Cotton mechanization isn't simple. It isn't just a machine of the right size, proper shape, and correct operation. It involves soil preparation, planting, cultivation, irrigation, pest control, harvesting, and handling. It includes also the production of cotton in combination with other crops and livestock, and in conjunction with non-farm work."—P. O. Davis, Director, Alabama Agricultural Extension Service, Auburn.

TRACTORS BECOME NECESSITIES—"The small farmer who could not afford a tractor to work his cotton acreage alone frequently found that he could not afford to be without a tractor when he added livestock to cotton."—Dr. E. V. Smith, Dean of the School of Agriculture and Director of the Alabama Agricultural Experiment Station, Auburn.

NEAR-MIRACLES EXPECTED OF GINS—"Today's ginner is not in an enviable position. The farmer expects to receive good turnout and samples regardless of the condition of the seed cotton he takes to the gin; and the competitive position of cotton demands a good job of ginning."—J. D. Hays, Vice-President, Alabama Farm Bureau Federation, Huntsville.

POSITIVE TESTS NEEDED—"The scientific research groups should work hard to develop rapid test methods to identify positively overheated or overmachined cotton. This would prevent injustices which occur when buyers reject or penalize cotton simply because it looks or feels 'different'. . . . We should also continue and expand the industrywide educational program to establish the limits of drying and cleaning, and encourage the ginners to follow the recommendations of the ginning specialists and gin machinery manufacturers."—George W. Pfeiffenberger, Research Director and Technical Consultant, Otto Goedecke, Inc., Hallettsville, Texas.

MORE PRODUCTION ESSENTIAL—"In spite of the evidences of surpluses at this present moment, I . . . suggest that over the next decade or so, the larger side of the cotton problem may still be, not how to get the markets, but how to get the production."—Dr. M. K. Horne, Jr., Economist, National Cotton Council, Memphis.

SMALL FARM EQUALITY SOUGHT—"Our goal in mechanization is to make the cotton grower's effort (in the Southeast) as productive, and, thus as well rewarded, as equal effort used in any other part of the Cotton Belt or in any other part of our national economy."—Claude L. Welch, Director, Division of Production and Marketing, National Cotton Council, Memphis.

they are supposed to do. I do not know about this, but I can comment upon a much more obvious limitation, one with which we have had some real experience in recent years—and that is the limits on our labor supply.

We might as well give up any illusions that the life of the typical cotton farmer today is as prosperous, as comfortable, as attractive, as the life of the man who works under good management in a modern factory at two or three or four times the pay. When factory jobs are available under these conditions, the able-bodied young farmer is going to keep on feeling the pull to the city. While this situation remains, industry is going to keep on taking our farm workers when farmers need them most and turning them back when farmers need them least. The problem will tend to get more acute as our economy grows and as the present generation of farmers passes on. We cannot ignore the implications of the fact that so much of our cotton today is being grown by old people. There is no real answer except for work on the farm to become so productive and rewarding that the rest of our economy can no longer treat agriculture as a vast pool of under-paid workers on which it can draw at will. There is no real answer except honest-to-goodness parity of income for farmers across the years of the future. And there is no hope for parity of income unless, first, we continue a vast expansion of machines, chemicals, and techniques to multiply the productivity of the farmer's hands, and unless, second, we have farmers with the training and know-how to make good use of those things.

Whether we see it from the demand side or from the supply side, the problems and the hopes of American cotton are represented in great measure by the challenge with which this mechanization conference is met to deal.

I have not pierced the veil of cotton's future; but as I see it dimly through the veil, it looks pretty good to me. It does not look like an **easy** future, and I can see no **guarantee** stamped on it—but it looks for all the world like a **real** future and a **big** one.

Bulletin Shows Influence Of Moisture on Yields

Comprehensive information on the influence of soil moisture on the production of cotton and other crops on the Rolling Plains of Texas is contained in a new publication available from Texas Experiment Station, College Station. Title of Bulletin 767 is Conservation and Utilization of Soil Moisture, and authors are C. E. Fisher and Earl Burnett of Texas Substation No. 7, Spur.

Based on 27 years of research at Spur, the publication shows a close relationship between the amount of available moisture stored in soil at planting time and the yield of cotton.

Pelleting Saves Feed

Use of all-pelleted feed saved up to 2,000 pounds of feed per 1,000 pounds of gain in feeding beef heifers at Washington State College, Pullman. Pellet-fed heifers used only 710 pounds of feed per 100 pounds gain, compared to 905 pounds of feed per 100 pounds gain for those fed non-pelleted grain roughage and concentrate.

(Continued from Page 37)

classer, indicating the probability of a lack of bloom or decreased brightness. He needed the guidepost of leaf because color gradations in classing are extremely small, being in some instances approximately one three-millionth of the visible color spectrum in degree. This is a color difference so extremely small that by itself, with no leaf to help categorize the colors, the classer has difficulty in consistently appraising this difference.

Small color differences are, of course, oftentimes important. Lack of brightness of cotton is associated with exposure in the field. The longer cotton is exposed in the field the lower becomes tensile strength, degradated by the sun's ultra-violet rays; also, harmful micro-organisms begin to feed on cotton with field exposure. There are many other reasons why small color differences are important, but it will not be necessary to go into them here.

From a staple standpoint in those days, what went into the gin also came out with its original length uniformity relatively undamaged by the gin's comparatively gentle mechanical treatment of the cotton fiber. If cotton were received wet by the gin, which would mean later loss in weight to the merchant and probable trouble from micro-organisms or cavitoma, he could detect this troublesome condition from the preparation or fiber alignment of the sample for it would usually be cut or gin cut by the saws.

Cotton values in those days could be described very satisfactorily by means of grade, staple, and preparation. Contrasted with time past the problems associated with relative quality evaluation and description now have increased tremendously, because of factors introduced by mechanization such as mechanical pickers, mechanical sledders and strippers, defoliants, gin driers, and lint cleaners.

I would like to touch lightly upon each of these developments so as to name just a few complications that each contributes to the problems of assessing cotton value and describing these values.

• **The Sled and Stripper** — These machines are usually operated only after all bolls in the field are open. They are most extensively used in frost areas. Here in many instances cotton that has been popped open by the frost is harvested simultaneously with cotton that has matured normally. The resulting mixture of the normal mature bolls with the frost bitten immaturely developed bolls results in a lack of uniformity within the bale from every fiber standpoint, particularly from a standpoint of maturity. The resulting variation from plate to plate in a bale is the cause of considerable difficulty in arriving at the bale's true quality value.

• **Cotton Spindle Pickers** — When these machines are used the classification of cotton harvested thereby requires almost an entirely new language. With this machine we have all kinds of unconventional foreign matter, such as: grass, tie vines, bark, green leaf, chlorophyll stain, etc.

• **Defoliants**—Some types of defoliants, used principally in connection with mechanical pickers, when applied prematurely kill the cotton plant and consequently prevent proper and normal maturation. Consequently we see an increase in the percentage of high grades having low maturity as a result of a defoliant applied at the improper time.

In addition to this, after the application of defoliants we often experience secondary growth of the plant. The cotton picker spindles oftentimes squeeze chlorophyll from this secondary growth, which results in chlorophyll stains. In a short time this stain turns to a brown-red very difficult to distinguish from our other spots caused by frost, insects, bacteria, fungi, dirt, etc., but having the special disadvantage of being almost impossible to bleach out.

• **Gin Driers** — This development has caused us many headaches when it is improperly used. Too much heat on cotton that is alternately wet and dry in the same load will cause layers within the bale to become very wasty, brittle, of bad appearance and poor spinnability. Natural essential waxes and oils are removed when too much heat is applied to the cotton fiber. Since water is the natural lubricant of cellulose, cotton fibers become very brittle when moisture is removed and therefore become more susceptible to rupture and breakage by the mechanical treatment of the gin saws. Fiber irregularity or poor length uniformity results.

I also understand that the higher one goes in heat, the greater percentage of linters or fuzz fibers are removed from the seed and incorporated with the regular lint fibers in the bale. These linters have an entirely different cell wall construction from lint cotton. Their tensile strength is considerably lower. Cell wall thickness is considerably greater, and these factors, along with the linters' shorter length and poor length uniformity, give excellent reasons why too much heat results in poor fiber quality.

• **The Lint Cleaner** — This development is a somewhat ticklish thing to mention at a conference like this because one hears so many pros and cons. Here is a pro and con instance rolled into one. Several years ago in the Southwest, we were observing a lint cleaner and conducting some tests.

A farmer brought a two-bale load of long staple seed cotton to a lint cleaner gin. One half of the load was run in the conventional manner with the lint cleaner by-passed. The other was run through the lint cleaner. The farmer put these two bales in the loan. The one that had not been lint cleaned classed Middling Spot 1 1/4 inch. The other, run through the lint cleaner, had its leaf removed so that it became Strict Middling in leaf and its spot so thoroughly blended and diffused with the white cotton that it had the appearance of Strict Middling Color. The government classed the lint cleaned bale as Strict Middling 1 1/4 inch and it went into the loan at a $50 premium over the non-cleaned bale.

For the farmer, of course, the lint cleaner in this instance was a very fine thing, but for the farmer's customer, the mill, it was not so good. Since both were approximately the same, both would spin approximately the same. Yet, one bale was approved as something that it wasn't as a result of the blending action of the lint cleaner saws.

So for the reasons mentioned as well as many more, cotton evaluation which formerly consisted of combinations of only grade, staple, and preparation factors now has so many other angles involved that the task of cotton description is extremely difficult compared to previous years. Because of these difficulties and because value is camouflaged, we have found it advisable to supplement our classers' ideas with laboratory tests. In Memphis today as well as in other of our company's offices we are running laboratory tests on every bale we handle. Mechanization has made our job in dealing with cotton values much more complicated and consequently more expensive.

That, gentlemen, is the reason we cuss it.

Now for the reason we are inconsistent with ourselves and pray for its success. Our business depends on volume . . . the number of bales merchandised. Volume depends on a healthy cotton industry, and a healthy cotton industry will depend on whether cotton has a low base price. Profitable cotton production at a low base price depends on successful attempts in cotton mechanization. In order to compete with synthetic fibers, many of which are competitive only from a price standpoint, and in order to compete with cheap foreign cotton production labor, it's absolutely essential, if this country retains its production prominence among the world's producing countries, that we make our farm labor more productive through mechanization.

Many of us who are cotton merchants therefore have found ourselves in the middle—between the devil and the deep blue sea—cussing one minute and praying the next for mechanization. Most of us have decided it's better to have jobs that are troublesome, worrisome, and expensive and have cotton mechanization, than to have no troubles and no job at all. In the final analysis, whether we are lucky and have our troubles or else unlucky and have no job, would seem to depend on you gentlemen and the interests you represent, and whether you completely succeed in what you are attempting to do.

Representing Fiber Quality

GEORGE PFEIFFENBERGER

Otto Goedecke Co.,
Hallettsville, Texas.

I WANT to give you a resume of our experience with mechanization as it affects fiber quality, taking mechanical harvesting and related processes of drying, ginning, and lint cleaning in their logical order.

Mechanical harvesting is divided into two general classifications, namely spindle type picking, and machine stripping. Along with these two different methods go a number of other variables such as areas where practiced, types of cottons subjected to each method, cultivation differences, and periods of harvesting. Such variables make it impossible to compare the two harvesting methods directly, as the cottons pro-

duced from each are used under different manufacturing conditions and for different purposes.

Keeping the two separate, let's turn first to spindle type picking. Early mill experiments with spindle picked cottons were not entirely successful due to excessive amounts of green leaf, trash, and especially to numerous twists of hard knotted fibers, often greatly discolored. These we nicknamed "bow ties" because they actually were tied in knots. They apparently were formed when fibers adhered to the spindles, perhaps because of too much moisture, and were twisted round and round, adding dirt and discoloration the longer they remained on the spindle. At that time these "bow ties" were accepted as positive proof that the cotton was machine picked, even though it may have been designated otherwise.

Greater experience with the pickers and more efficient cleaning methods at the gin have reduced these "bow ties" to some extent, making it now more difficult to identify positively machine picked cotton. These twists were not only dead giveaways of the harvesting method, but they were real drawbacks in spinning. They defied beater after beater in the mill opening and cleaning machinery, and one could actually stand at the delivery end of the mill pickers and snatch these twisted fibers out of the lap as it was being wound. The card licker-in removed many of these defects, but this of course added substantially to the card waste. Some hard, tangled fibers actually got through the card and came out in the production to make trouble in later processes.

Other than this we found no serious fault with machine picked cotton in those days, as the extra trash and leaf was in most cases compensated for by the price of the lower grades being produced from mechanically picked cotton. One advantage which it actually had was a slight increase in yarn strength over hand picking, which was probably due to the fact that only the more uniformly mature bolls were open to the spindles so that maturity of the fiber was more uniform.

Our experience with machine stripped cotton was much more limited, but we did not find much difference between it and hand snapped cotton when the two methods were tested at the same time of the season. Gins in the short staple areas where stripping is prevalent are equipped with elaborate cleaning devices, which for all practical purposes wipe out the differences in the two harvesting methods.

Since machine stripping is generally performed towards the end of the season, there are generally open bolls, partly opened, and closed bolls on the plants. As everything is stripped at once, and the bolls are cracked open in the gin machinery, the sample usually contains a wide range of fiber maturity. This makes for doubtful character, irregular fiber length, variations in fiber fineness and strength, and increases risks for the mill.

I do not by any means want to imply that all stripped cotton is this extreme, or that the cotton is not fit for use. On the other hand, there are many uses for such cotton in various lines of goods, and the informed cotton buyer is well aware of its possibilities as well as its limitations.

In general, it is our conclusion that mechanical harvesting **per se** does no visible physical damage to the fiber, although the additional amounts of leaf, trash, and "bow ties" definitely lowered the spinning efficiency.

• **Drying and Lint Cleaning** — At the present time the question of seed cotton drying is just about as hot as the temperatures the ginners are accused of using, and it is a subject that I approach with caution as I have no desire to get my fingers burned.

The general consensus among mill buyers and operators is that a substantial amount of cotton is being damaged by overdrying, by overcleaning, or by a combination of both, and the mills are quite vociferous in their complaints. I, for one, could not say that they do not have a case, because I have occasionally seen cotton about which there could be little argument that it was damaged. It appeared to be lifeless with a harsh, brittle feel, and in some cases had a light brownish or toasted color with a scorched odor. Fiber arrays showed such cotton to be quite irregular and wasty, and unpleasant mill experiences showed it to be unable to stand up in the processing.

It is not these extreme cases, however, which pose the real problem. It is the borderline cases, which are either impossible or very difficult to detect in classing procedures, which sneak in and wreak havoc in the mill.

As to the percentage of the crop which is damaged, however, the whole situation reminds me of a story my grandmother used to tell me when I was a little boy and she thought I was guilty of exaggeration. (That, of course, was before I moved to Texas and learned to stick closely to the truth.)

It seems there was a little girl idly looking out the kitchen window into her back yard. Suddenly there was a terrific racket with screeching and yowling, and the little girl, greatly excited, yelled, "Mother, Mother, come quick, there's a thousand cats fighting in our back yard."

Her mother replied, "Now, now, Mary, you know that's an awful lot of cats; there couldn't be that many."

Mary, only slightly subdued, came back with, "Well, Mother, there's a hundred of them anyway."

Mother, still not feeling the lesson had gone home said, "Now, Mary, are you sure there's that many?"

A short delay while Mary took another look, then she turned to her mother and said somewhat sadly, "Well, anyway, it's our cat and another one."

This story pretty well illustrates my personal opinion about this overdrying business. I'm sure it is being done and is causing trouble, and one ginner and another one in any backyard can stir up a terrific racket. As a result the whole ginning industry takes the rap and much of the spinning industry stays in a constant state of the "jitters" wondering what is coming next.

Since there are already too many unfounded accusations being thrown around by both sides, I certainly do not want to speculate any further, but will stick to factual information resulting from a number of ginning and spinning tests. The results quoted here are from cooperative tests conducted by the Institute of Textile Technology, the Delta & Pine Land Co., and the Chicopee Manufacturing Corp. I wish to thank these three organizations for releasing this information to present to you today. I would like to point out that the spinning tests were conducted under well controlled pilot plant conditions.

A large, thoroughly blended lot of seed cotton was ginned at three drying temperatures, low, normal, and high, and with and without a saw lint cleaner. Results are summarized as follows:

1. Lint cotton decreased in moisture content from about five percent for the low heat to four percent for the normal heat, and then dropped to only two percent for the excessive heat. This means that at the moment of contact of the lint with the gin saws the fibers were extremely dry.

2. Two different classers observed significant grade improvement as successively higher temperatures were used. A full grade improvement was noted for the sample through the lint cleaner.

3. Both classers also found progressive decrease in length due to higher temperatures, but no decrease in length due to lint cleaning.

4. Supplementing the classers, the fiber arrays also showed definite decrease in fiber length due to increased temperatures, but only a slight loss of length due to the lint cleaner. Fiber arrays on the seed cotton indicated that the chief cause for loss of staple was shrinkage by heat before the fibers ever even hit the gin saws. This appears to be rather definite proof that the drying operation at excessive temperature is the cause of length loss, and not the lint cleaner which many had blamed.

5. Each successively higher temperature produced successively lower Shirley Analyzer trash, and the lint cleaner was responsible for a very definite lessening of trash in the bale.

6. Fiber fineness, maturity, and strength were not visibly affected by any of the operations.

7. Mill waste losses were lower with

Good Practices Offset Acreage Reduction

Proper use of fertilizer on cotton, in accordance with recommendations of the Experiment Station and local authorities in each state, can increase cotton yields, reduce production costs and enable many producers to offset much of the effect of acreage reduction in 1954.

Twenty million acres of cotton, properly fertilized, would have produced as much lint and seed as were produced on an average of 22 million acres annually during the 10 years, 1941-50, according to the National Fertilizer Association. Cost of the additional fertilizer would have been $64 million, W. R. Allstetter, vice-president of the fertilizer group, pointed out at the recent National Agricultural Chemicals Association convention; but the net savings of cotton producers would have totaled $113 million.

Ginners and crushers will help farmers, as well as serve their own interests, by starting early to emphasize such facts. The key to maintaining cotton production at the highest possible level on the reduced 1954 acreage is wider use of fertilizer and other practices that will step up acre yields.

the higher drying temperatures as would be expected from the higher grades. Nep counts were not affected by any of the operations.

8. Spinning ends down were not significantly affected by the different treatments in the 30's warp yarns, but in the finer 40's filling yarns the ends down were substantially increased by the excessive drying temperature. The use of the lint cleaner had no effect on ends down.

9. Yarn strength was significantly lowered by the excessive temperature. The lint cleaner had no effect on yarn strength.

• **Conclusions** — It is apparent that though the technical effects of these ginning practices were relatively small from the spinning standpoint, the market value of the cotton was definitely affected through changes in grade and staple. Grade was raised to a degree which normally would enhance the price more than the price reduction due to the shorter staple. Superficially, this appears to benefit the farmer, but if the drying is carried to extremes it could well result in large scale rejections by mill buyers on the basis of overdried and overmachined lint, and give a black eye to certain gins or areas, which would then turn a temporary profit into a permanent loss.

In closing, I would like to leave two suggestions. First, the scientific research groups should work hard to develop rapid test methods to identify positively overheated or overmachined cotton. This would prevent injustices which occur when buyers reject or penalize cotton simply because it looks or feels "different" from what they have been used to in the past. It is quite possible that some "different" appearance or feel might be on the credit side, rather than always on the debit. We must learn how to classify these "differences" and follow them up with mill spinning tests in order to be sure what they really mean.

Second, we should continue and expand the industrywide educational program to establish the limits of drying and cleaning, and encourage the ginners to follow the recommendations of the ginning specialists and gin machinery manufacturers. If both parties make an effort to understand the other fellow's problems, nothing but mutual benefit can result. It is in just such meetings as this conference, where we have frank interchange of ideas, that the foundations are laid for mutual understanding and trust.

Representing Spinning

WALTER REGNERY

Joanna Cotton Mills Co.,
Joanna, S.C.

AS MANY of you may know, I have been most active in textile research, dealing with possible improvements in getting cotton from the baled state to finished cloth. We have applied many research results to our operation at Joanna Cotton Mills Co. I believe one of the biggest changes at our mill has been in our idea of the amount of cleaning, or machining, of the fiber up to the carding operation. Ten years ago the cotton going through our mill went throgh seven different beating, or cleaning, points by the time it was through the card or final mill cleaning. Today the cotton goes through only four beating or cleaning operations—42 percent less working of the fiber. All this time we ran on the same middling or better cotton. Today we have a cleaner card sliver with more spinnable fiber than we had 10 years ago. We are taking out three percent less waste based on raw cotton opened than we did 10 years ago. We have stronger yarn with fewer neps today which can be directly attributed to less machining of the cotton.

One might well ask, were these large savings made because better and improved cleaning methods were devised? This was not the case, as we use materially the same cleaning methods. The simple answer is that we were doing entirely too much cleaning 10 years ago. Up to this time, we let the machinery manufacturers sell us whatever they thought was necessary. We have since analyzed the problem ourselves, and found that for our clean cotton all this machining and beating was unnecessary. It is true that for lower grade cotton some of this machinery, or cleaning equipment, would have to be added back into our mill.

I wonder if the thinking and changes in our mill cannot be related to present day ginning operations? Specifically, are the gins adding cleaning machinery or cleaning methods to solve the problems of getting better grades out of late picked or machine picked cotton and then using the equipment on all cotton going through the gin regardless of whether or not it needs cleaning? Anyone will admit that when you have trashy and often wet seed cotton, the new dryers and cleaning equipment in gins are essential to give a cotton that can be used by a mill. What about the early picked cotton, which is dry and clean? Why should this be subjected to the same harsh treatment as the dirty cotton? Added to this problem is the early picked, high grade cotton going into our finer yarns, where any fiber damage at either the gin or mill is most critical in giving spinning performance. The lower grades that come out of later pickings go into coarse yarns where some fiber damage makes little difference in the mill performance.

The 17-mill tests on ginning procedure bring out by actual experiment the same point of the danger in overmachining or overdrying of cotton. These large cooperative tests ran cotton into cloth which had been ginned under the following five conditions:

1. Without modification of the usual practice, so-called "normal" ginning.
2. As in No. 1 except at a faster rate.
3. As in No. 1 except the overhead cleaners were by-passed.
4. As in No. 1 except the lint cleaners were by-passed.
5. As in No. 1 except at a higher temperature.

Test No. 4, where the lint cleaners were by-passed or where the cotton received the least amount of machining at the gin, gave a marked reduction in neps at the mill. The tests show that a reduction in neps of 25.5 percent in the card web or 16.5 percent in the finished cloth can be made at the mill level by elimination of cleaning equipment.

The reduction of 25 percent in the card nep count is very important to all concerned in our industry, and this improvement would be most difficult to get in any other way. For the mill to get this reduction, it would have to card at a slower rate. The average carding rate for the 17 mills was 9.5 pounds per hour. To reduce the nep count 25 percent, I would estimate, from tests that have been run in carding rate vs. neps, that the rate would have to be reduced to seven pounds per hour. In the case of a 100,000-spindle print mill this would mean the addition of 80 cards, with an investment cost of $320,000. These extra cards would cost the mill about $25,000 in additional direct labor cost per year to operate. In other words, the ginners should use great caution in either overdrying or overmachining the cotton, as it well might add so much to mill costs or add so many neps to the

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finished product that cotton will be replaced by synthetic fabrics.

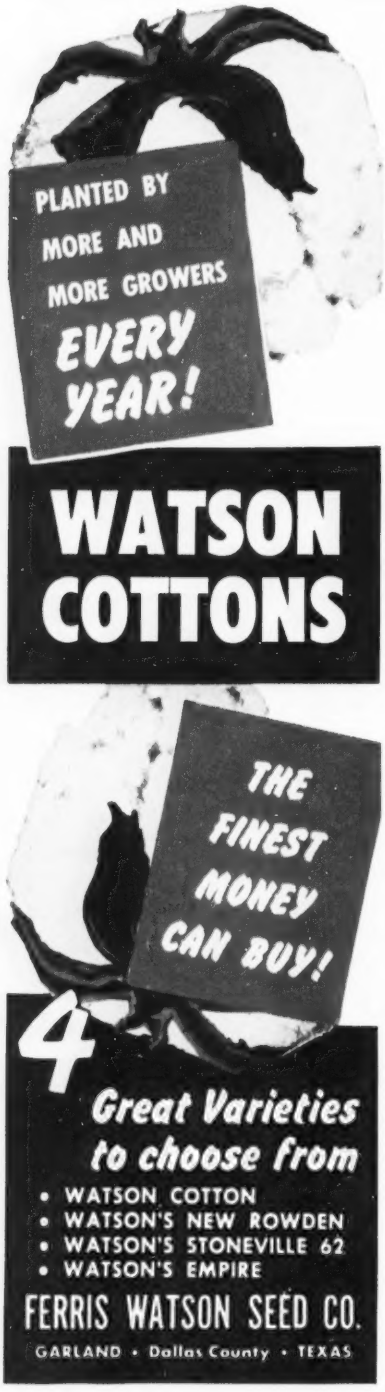
Ends down in spinning shows the same result as that of neps. These figures, too, are very significant to the spinner and therefore should be well noted by the ginner. Thirty-eight ends down, as shown for Test 4, is about the maximum the spinner can have and still maintain his operative work load. Anything higher than this would require a smaller work assignment or a lowering of the spinning production to bring the ends down back to standard. Either of these changes would result in higher manufacturing costs, making cotton less competitive with other fibers. Forty-nine ends down, as was the average for Test 5, would require the change to be made.

The test also showed that overdrying and maximum machining at the gin resulted in lower yarn strength, as well as lower cloth strength. The amount of this difference was small, but the results were all consistent from mill to mill. The strongest yarn and cloth were made from Test 4 cotton.

Certainly then, both from the mill operating standpoint and quality of finished product, Test 4 cotton was the best and most economical. I believe the type of raw cotton tested here definitely should not be subjected to extra cleaning or excessive heat for the good of everyone in the industry.

I would like to suggest here today that real thought and constructive efforts be directed toward keeping heat to a minimum at the gin.

Also, in the early season when cotton is already clean, the cotton going through the gin should be by-passed around lint cleaners. I say this even though the grade may be lowered as much as one-half grade. I feel sure that if this practice is followed, we will all be better off as our finished product will be more competitive against synthetic fibers.



Processing of Cottonseed

(Continued from Page 26)

value of cottonseed meal as affected by conditions of processing and to develop, if possible, modifications in processing conditions to produce meals of improved nutritive value. In making this investigation studies were initiated to determine the effect of variations in cooking and pressing and in type of solvent used in extracting oil on the nutritive value of the meal.

It was soon clear that any change in processing conditions which affected the quality of the meal would likewise affect the quality of the oil. Furthermore, it became evident that it should also be possible to improve the quality of the oils by changing processing conditions, and that there probably existed a set of conditions which would simultaneously improve the quality of both the oil and the meal. Therefore, a program of research which began as an effort to improve the nutritive quality of cottonseed meal through processing was of necessity broadened to a comprehensive program of investigation of the factors affecting the quality of the oil and meal and the development of processes which would simultaneously improve both.

The research being conducted at the present time is based upon the demonstration by this laboratory in cooperation with the cottonseed industry and nutrition investigators of these two facts:

1. Cottonseed meal is a variable nutritional material for swine and poultry. The value depends to a large extent upon the conditions of processing.
2. When properly processed, cottonseed meal has a high nutritive value and can be fed freely to growing chickens and to swine. These facts were demonstrated as follows: A special meal was prepared in the pilot plant of the Southern Laboratory under conditions where gossypol was extracted without applying excessive heat during any part of the process. In chick and hog feeding experiments the growth rates with this meal ranged from 30 to 40 percent better than with some commercial meals. Moreover, meals of high nutritive value were produced experimentally by the screw-press process in commercial mills under controlled conditions where meats of low moisture content were not heated above 200° F. before screw-pressing.

Three difficulties were encountered in processing the low-temperature screw-press meals which would prevent their immediate acceptance by the industry. These were: (1) reduction in throughput of the press by use of low temperature cooking, (2) increase in fines, and (3) increase in the color bodies in the oil which increases the amount of color reversion in the crude oil upon storage for periods of a month or so. Research is continuing to develop means of overcoming such difficulties of low temperature screw-press operation. Meanwhile, by calling attention to the difficulties encountered the cottonseed industry is being encouraged to seek practical means of lowering the processing temperatures wherever possible.

These demonstrations have reopened the entire question of the effect of conditions of processing on the quality of cottonseed meal and have awakened considerable interest among research workers in state and federal agencies and industry. The National Cottonseed Products Association supported this program through the efforts of its Educational Service, fellowship program, and the aid and advice of individual members. Out of this has developed a comprehensive cooperative program of scope large enough to deal with the problem adequately.

The lines of work that have been undertaken to solve these complex problems are summarized as follows:

(a) Cooperation with nutrition in-

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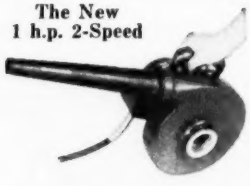

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vestigators: On a limited basis, standard meals and specific blends of meals are being furnished to nutrition investigators to solve nutritional problems, such as: (1) development of means of reducing or eliminating egg yolk discoloration caused by small amounts of free gossypol remaining in the meal; (2) determination of the effect of the quality of cottonseed meal when it is blended with other sources of protein such as soybean meal; and (3) determination of the exact amount of supplementary amino acids needed to improve the nutritional quality of cottonseed meals and the relationship between the boost given by lysine supplementation and the processing history of the meal.

(b) Nature of bound gossypol: Closely related to this study is an investigation in the laboratory of the nature of bound gossypol in commercial samples of cottonseed meal and in model compounds prepared from gossypol and pure proteins and amino acids. This study is designed to determine the different types of bonding that take place between gossypol and constituents of the meal during cooking.

(c) Initial content of gossypol in seed: The initial content of gossypoi varies with samples of cottonseed, depending upon variety and upon the location of growth. A study has been planned on the effect of the original gossypol content on the quality of the meal and oil when produced by standard conditions of processing in the laboratory.

(d) Chemical measure of nutritive value: Reactions between gossypol and components of cottonseed are being studied to determine the effect of cooking in the presence of gossypol on the constituents of cottonseed. This is designed to achieve a greater understanding of the type of reactions that affect nutritive value and to try to arrive at a chemical measure of nutritive value which will be more reliable and which will give closer correlation with actual nutritional measurements than the previous methods which have been proposed.

(e) Survey of commercial processing: The very interesting results that have been obtained with several prepressed-solvent extracted meals indicate that this process should be carefully investigated. Therefore, a survey of the prepress-solvent extraction operation in mills selected to be representative of the entire cotton processing area is under way. Samples of meal and oil are being taken throughout the process and analyzed in the laboratory and samples of the meal are being evaluated for nutritional purposes. The results of this survey and other similar surveys should provide a rather complete evaluation of current commercial practice in the prepress-solvent extraction operation.

(f) Laboratory study of cooking: One of the most critical operations in cottonseed processing affecting the quality of the products is the cooking operation. Therefore, a comprehensive laboratory research program on the variables in cooking is under way. This includes the study of the effect of moisture content, temperature, time, and the addition of chemicals.

(g) Pigments of cottonseed oil: Because the pigmentation of the oil is critically affected by processing conditions, a study has been initiated to isolate the pigments in cottonseed oil, to study their properties, and to develop specific methods for their removal.

II. Preliminary Report of Results of Laboratory Research Cooking Studies:

Research conducted at the Southern Regional Research Laboratory and in cooperating laboratories has demonstrated that processing conditions greatly influence the quality of the meal and oil. Based on these studies it was estimated that the nutritive value of cottonseed meal as now produced could be increased by as much as 25 percent. To verify these estimates a fundamental study was begun to determine the effect of different types of cooking, including the effects of addition of acid and alkali, on the nutritive value of the meals as measured by the growth rate of young chickens. To date the best results have been obtained by rolling the meats, breaking the pigment glands by vigorous stirring of the meats with about 35 percent of water containing bases or acids in a Hobart mixer*, modified to produce the required mechanical action, followed by drying at a maximum temperature of about 212° F. Oil was extracted with a laboratory type solvent extraction apparatus. This type of cooking is best illustrated by the following typical example:

Flaked cottonseed meats (moisture content 7 percent) were agitated in the bowl of the Hobart food mixer and moistened with water containing sodium hydroxide. The materials were adjusted to yield a moisture content of 35 percent and a sodium hydroxide content of 0.5 percent based on the weight of the flakes (3 kg. flakes, 15 g. NaOH, 1290 ml. H_2O). After 30 minutes agitation at room temperature essentially all of the pigment glands were broken and heat was then applied for an additional 30 minutes to raise the temperature of the meats to a maximum of 212° F. During the heating period the oil coalesced to a readily extractable form and the moisture content was lowered to about 7-10 percent.

The nutritive value of the meal was determined by chick feeding studies conducted under the direction of Professor A. B. Watts at the Poultry Husbandry Department of Louisiana State University, and supported in part by the Educational Service of the National Cottonseed Products Association. Butanone extracted meal was used as a standard and given an arbitrary index value of 100. When approximately 0.5 percent alkali (NaOH), based on the weight of the meats, was used in the cooker, many of the meals had an index value of about 120 and free-gossypol contents below 0.03 percent. Similar values were obtained when a small amount of phosphoric acid was used, although the free-gossypol content was higher. Over 100 meals have been prepared and compared on this scale. Commercial meals range in index from about 40 to 90; many of them rate from about 75 to 85. Crude oils from the alkali cooks are light yellow in color; those from acid cooks are red.

No attempt has been made to determine modifications necessary to adapt these findings to commercial processing. The purpose thus far has been to establish principles without reference to commercial application.

Pigments in Cottonseed Oil:

Pigments in cottonseed oil have become a serious problem within the past

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10 years because of the rapid change from hydraulic to screw-press and prepress-solvent extraction procedures. In the hydraulic mills the meats are moistened and cooked at high temperatures and the oil extracted at relatively low pressures. Under these conditions nearly all of the pigments remain in the press cake and an oil with good refining and bleaching quality is produced. In mills in which modified cooking procedures and high pressures in the presses are used, a greater percentage of the pigments are extracted and oils that are more difficult to refine and bleach are produced. At the present time representatives of the cottonseed industry have estimated that over 25 percent of the oil now received at refineries cannot be bleached readily to a satisfactory color.

Research is under way to identify pigments responsible for the color so that methods for their removal can be devised. A pigment already identified in oil is gossypol. It is soluble in alkali and is removed from the oil by alkali refining. However, when crude oils are stored, especially at high temperatures, gossypol is converted to alkali insoluble compounds which are difficult to remove from the oil (color reversion). It would seem that color reversion might be prevented by adding an excess of a non-toxic, alkali-soluble chemical that would form an oil-insoluble compound with gossypol. To establish this principle, p-aminobenzoic acid, an example of such a group of chemicals, was added to nine different samples of oil from commercial oil mills. Samples of oil with and without the chemical added were shipped to the Southern Laboratory by air express and refined and bleached before and after 30 days storage at 100° F. The method and results are illustrated by the following example:

A solvent-extracted oil was treated immediately after removal of solvent with an amount of solid p-aminobenzoic acid sufficient to react with all of the gossypol in the oil. (Two moles of p-aminobenzoic acid react with one mole of gossypol.) After a month's storage at 100° F., the control oil was refined and bleached by Official Methods and yielded a final bleached oil with a color 13 red. The oil which had been treated was filtered prior to refining and bleaching to yield an oil with a bleached color of 1.3 red. In the samples of oil that were investigated, the bleach color obtained after storage for one month at 100° F. ranged from 1.0 to 2.5 red for the treated oils. In the same group the untreated oils varied in bleach color from 1.6 to 13.0 red.

Among the problems that must be solved to adapt this process for commercial operation are development of methods of improving the crystalline form of the precipitate in order to facilitate filtration or centrifugation from the crude oil, reduction in the loss of oil due to the pigment precipitation, recovery of the precipitating agent, the selection of inexpensive precipitating agents, recovery of gossypol, and finding valuable uses for gossypol.

The titles and authors of two papers being prepared to describe new developments in more detail are:

(1) The Effect of the Addition of Chemicals During the Processing of Cottonseed on the Properties of the Meal and Oil.

W. H. King, L. T. Wolford, F. H. Thurber, and A. M. Altschul, Southern Regional Research Laboratory, and A. B. Watts, Louisiana State University.

(2) The Prevention of Color Reversion in Crude Cottonseed Oils.

J. M. Dechary, R. P. Kupperman, F. H. Thurber, and R. T. O'Connor, Southern Regional Research Laboratory.

Summary

Some of the commericial meals now available are undoubtedly superior to the average of meals produced by the entire industry and more suitable for feeding to growing swine and poultry. The surveys now in progress will provide a comparison between prepressed-solvent extracted and other types of cottonseed meals. Screw-press meals which have not been heated over 200° F. prior to screw-pressing have been fed to growing chicks and hogs and have been entirely satisfactory as a source of protein. Widespread commercial utilization of the newer knowledge about cottonseed meal nutrition and the effect of processing on oil color depends upon the successful completion of the fundamental research program. The new findings reported in a preliminary manner in this publication may lead to the development of modified commercial processes for producing oil and meal of higher quality.

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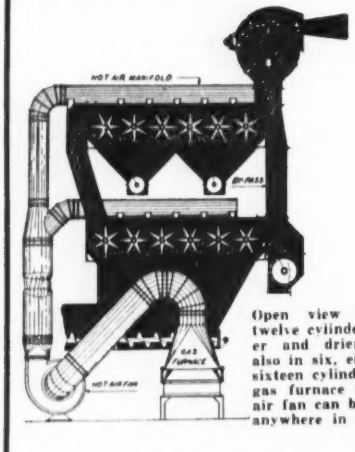

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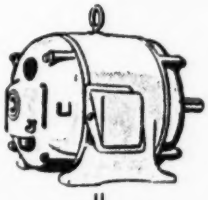

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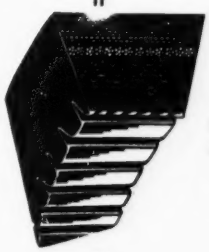

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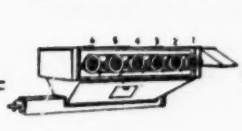

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laugh it off

In designing man's hinges, the Creator knew he would have little occasion to pat himself on the back.

• • •

White Friend: "Mose, do you think it right to leave your wife at the washtub while you spend your time fishing?"

Mose: "Oh, yassuh, Mah wife don't need no watchin'. She wuk jes as hard as if'n ah wus dere."

• • •

A group of few-year-olds were discussing possible amusements for a rainy afternoon. Someone suggested that they turn on television.

From across the room Jean, a seven-year-old, pouted: "I've been watchin' television all my life. Why don't they get something new?"

• • •

"I wonder why Mrs. Jones always brings her knitting to our meetings."

"It gives her something to think about while she talks."

• • •

"Why did you get a divorce?"

"My wife called me an idiot."

"That's not sufficient cause for a divorce."

"Well, you see, it was like this. I came home and found my wife in the arms of the chauffeur, and I said: 'What's the meaning of this?' and she said, 'Can't you see, you idiot?"

• • •

Jackie, a six-year-old, was visiting his mother and his new sister at the hospital and, getting bored, wandered into the next ward to talk with an elderly woman who had broken her hip. Becoming confidential, he asked:

"How long have you been here?"

"Oh, about six weeks."

"Can I see your baby?"

"I'm afraid I don't have one."

"Gee, you're slow," said Jackie. "My mother's only been here two days and she's got one already."

• • •

A schoolboy was making a speech about the national debt and said: "It's too bad that the future generation can't be here to see the magnificent things we are doing with their money."

• • •

A man spotted a young woman futilely backing in and out of a parking space. Ten minutes later, thanks to his directions, the car was neatly parked in the space.

"Thank you very much, sir," the woman said. "This is very nice, but I was trying to get out!"

• • •

A yellow convertible sped down a country road and hit a rooster. The farmer came over and berated the driver. "Take it easy," the driver insisted. "I can replace your rooster." "Yeah?" queried the farmer, "I don't think the hens would like that very much."

• • •

"I saw your wife today and she had a black patch over one eye. What happened?"

"Nothing. That's her new hat."

• • •

A movie producer was telling a friend about giving his girl friend a string of pearls for her birthday. "Why," said the friend, "don't you give her something practical—like a car?"

The producer smiled and replied: "Did you ever hear of a phony car?"

• Nov. 9-10-11—Third Conference on Cottonseed Processing and Meal Quality. Southern Regional Research Laboratory, New Orleans. Sponsored by USDA and Educational Service, NCPA. For hotel reservations, write Dr. C. H. Fisher, 2100 Robert E. Lee Boulevard, New Orleans.

• Nov. 30-Dec. 1—Tenth Annual Cotton Spinner-Breeder Conference. Cleveland Hotel, Spartanburg, S.C. For information write B. F. Smith, secretary-manager, Delta Council, Stoneville, Miss.

• Dec. 10-11-12—American Chemical Society regional conclave. Jung Hotel, New Orleans. T. H. Hopper, Southern Regional Research Laboratory, 2100 Robert E. Lee Boulevard, New Orleans, general chairman.

• Dec. 16-17-18—Seventh Annual Cotton Insect Control Conference. Peabody Hotel, Memphis. For information write the National Cotton Council, P. O. Box 18, Memphis 1.

1954

• Jan. 11-12-13—Southern Weed Conference. Memphis, Tenn. Dr. W. B. Ennis, Mississippi Experiment Station, State College, Miss., conference chairman.

• Feb. 1-2—National Cotton Council of America, sixteenth annual meeting. Atlanta. Wm. Rhea Blake, P. O. Box 18, Memphis, executive vice-president.

• Feb. 8-9—Texas Cooperative Ginners Association, Texas Federation of Cooperatives and Houston Bank for Cooperatives joint meeting. Austin, Texas. Bruno E. Schroeder, 307 Nash Building, Austin, Texas, executive secretary and treasurer.

• Feb. 15-16—Third Annual Cottonseed Processing Clinic Southern Regional Research Laboratory, New Orleans. Sponsored by Valley Oilseed Processors Association and the Laboratory. C. E. Garner, 1024 Exchange Building, Memphis 3, Association secretary.

• Feb. 15-16—The Carolinas Ginners Association annual convention. Hotel Charlotte, Charlotte, N. C. Clifford H. Hardy, 400 Broad Street, Bennettsville, S. C., executive secretary.

• March 2-3—Oklahoma Cotton Ginners' Association annual meeting. Biltmore Hotel, Oklahoma City. J. D. Fleming, 1004 Cravens Building, Oklahoma City 2, secretary.

• March 18-19-20—Third Annual Midsouth Gin Supply Exhibit. Midsouth Fairgrounds, Memphis. For information write W. Kemper Bruton, executive vice-president, Arkansas-Missouri Ginners' Association, P. O. Box 345, Blytheville, Ark. Arkansas-Missouri and Tennessee ginners' associations will hold annual conventions in connection with the exhibit.

• March 18-19-20 — Arkansas-Missouri Ginners' Association annual convention. Memphis. W. Kemper Bruton, P. O. Box 345 Blytheville, Ark., executive vice-president. To be held concurrently with Midsouth Gin Supply Exhibit.

• March 18-19-20 — Tennessee Cotton Ginners' Association annual convention. Memphis. W. T. Pigott, P. O. Box 226, Milan, Tenn., secretary-treasurer. To be held concurrently with Midsouth Gin Supply Exhibit.

• March 19-20-21—Seventh Annual West Coast Divisional Meeting, International Oil Mill Superintendents' Association. Paradise Inn, Phoenix, Ariz. H. F. Crossno, P. O. Box 15345, Vernon Branch, Los Angeles, meeting chairman.

• March 29-30—Valley Oilseed Processors Association annual convention. Buena Vista Hotel, Biloxi, Miss. C. E. Garner, 1024 Exchange Building, Memphis, secretary.

• April 1-2—National Cotton Compress and Cotton Warehouse Association annual convention. Roosevelt Hotel, New Orleans. John H. Todd, 1085 Shrine Building, Memphis 3, executive vice-president.

• April 5-6-7—Texas Cotton Ginners' Association annual convention. State Fair Grounds, Dallas. Jay C. Stilley, 109 North Second Avenue, Dallas, executive vice-president. For exhibit space, write R. Haughton, president, Gin Machinery & Supply Association, Inc., 3116 Commerce Street (P.O. Box 444), Dallas 21.

• April 12-13-14—American Oil Chemists' Society spring meeting. Plaza Hotel, San Antonio, Texas. Mrs. Lucy R. Hawkins, 35 East Wacker Drive, Chicago, executive secretary.

• May 7-11—National Cottonseed Products Association annual convention. Shamrock Hotel, Houston. S. M. Harmon, 19 South Cleveland Street, Memphis, secretary-treasurer.

• May 24-25 — Oklahoma Cottonseed Crushers' Association annual meeting. Lake Murray Lodge, Ardmore. J. D. Fleming, 1004 Cravens Building, Oklahoma City 2, secretary.

• May 31-June 1—Alabama-Florida Cottonseed Products Association and Georgia Cotton Crushers' Association annual joint convention. General Oglethorpe Hotel, Wilmington Island, Savannah, Ga. T. R. Cain, 219 Church Street, Montgomery, executive secretary, Alabama-Florida association. J. E. Moses, 318 Grand Theatre Building, Atlanta 3, secretary-treasurer, Georgia association.

• June 2-3-4—Tri-States Oil Mill Superintendents' Association annual convention. Hotel Buena Vista, Biloxi, Miss. Roy Castillow, Southern Cotton Oil Co., Little Rock, Ark., secretary-treasurer.

• June 6-7-8-9—International Oil Mill Superintendents Association annual convention. Plaza Hotel, San Antonio, Texas. H. E. Wilson, Peoples Cotton Oil Co., Wharton, Texas, secretary-treasurer.

• June 7-8—North Carolina Cottonseed Crushers Association-South Carolina Cotton Seed Crushers' Association joint annual convention. Ocean Forest Hotel, Myrtle Beach, S. C. Mrs. M. U. Hogue, P. O. Box 747, Raleigh, N. C., secretary-treasurer, North Carolina association; Mrs. Durrett L. Williams, 609 Palmetto Bldg., Columbia, S. C., secretary-treasurer, South Carolina association.

• June 13-14-15 — Texas Cottonseed Crushers' Association sixtieth annual convention. Shamrock Hotel, Houston. Jack Whetstone, 624 Wilson Building, Dallas, secretary.

• June 30-July 1-2—Mississippi Cottonseed Crushers' Association forty-fifth annual convention. Hotel Buena Vista, Biloxi. J. A. Rogers, 207 One Hundred East Pearl Building, Jackson, secretary.

• July 6-7-8—Oil Mill Operators' Short Course. Texas A. & M. College, College Station. For information write Dr. J. D. Lindsay, head, department of chemical engineering, Texas A. & M. College, College Station.

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Economics of Mechanization

(Continued from Page 24)

size is used, most of the farm operating units in this area are very small.

• **Progress and Problems**—These small units long have been, and still are, our big problem units. Many of these units are characterized by poor utilization of productive resources, low production rates, and low levels of farm income. Largely because of economic and managerial limitations, these small units have not made full and effective use of the many new and improved scientific and technological developments that have occurred in recent years. The adoption and efficient use of these developments often involve major adjustments in the organization, operation, and management of individual farms. They usually require additional capital, an item which is nearly always in short supply on small farms.

No one familiar with agriculture in the Southeast and the changes that have taken place in recent years would deny that tremendous progress and vast improvements have been made in its overall economy. The gains that have been made, however, for the most part, have been on farms that were above average in size, were above average in general fertility, were generally adaptable to the use of mechanized machinery and equipment, were generally adapted to the use of livestock as a supplement to cash crops, and were operated by farmers who had adequate resources for making needed changes, and who were above average in managerial skills and abilities. These operators, blessed with several years of high incomes, were able to make desirable shifts and adjustments about as rapidly as was technically and economically feasible.

This group, however, constitutes but a small proportion of the farmers in the area. The vast majority are less favorably situated. They live on and operate relatively small units. They are dependent, in most cases, on a single major source of income. Their income levels are low, and they have only limited money savings. Even with high prices, their incomes are little above living needs. They are dependent mainly on credit for financing annual farm operations. Many have too little collateral to obtain adequate credit under usual requirements to finance adequately present annual operations, let alone credit for making long - time improvements, expanding size of farms, purchasing power and equipment, developing pastures, and making other needed adjustments.

• **Cotton Acreages**—If we are to think in terms of complete mechanization of cotton production and harvesting in this area, we need to consider the importance of cotton in the over-all economy of this area and of the entire Cotton Belt. In the Southeast, about 40 percent of the area's more than two million farmers produce cotton. In major cotton-growing states within the area, this percentage is even higher. Operators of these cotton-producing farms in the Southeast normally plant half the cotton acreage of this country and normally produce more than 60 percent of the country's cotton crop. Because most farms in this area are relatively small, a large part of the cotton is produced on small farms.

The average acreage of cotton per farm for the entire area is 14 acres per cotton producing farm. Most producers, however, have less than 14 acres. At present, half of the cotton producers in the area harvest less than 10 acres of cotton per farm. Nearly ninety percent

Distribution of Farms in 11 Southeastern States, by Specified Measures of Size (Source: 1950 Census)*

Measure of size	Number of farms	Percentage distribution of farms	Cumulative percentage distribution
Land in farms:			
Less than 30 acres	712,937	35	35
30- 49 acres	362,441	17	52
50- 99 "	459,367	23	75
100-179 "	296,644	14	89
180-259 "	98,131	5	94
260 acres and over	124,073	6	100
Total	2,053,593	100	
Cropland harvested:			
Less than 50 acres	1,592,161	87	87
50- 99 acres	165,091	9	96
100-199 "	45,177	3	99
200 acres and over	19,831	1	100
Total	1,822,260	100	

*Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

Gross Income and Estimated Net Income per Farm, by Size of Farms, Eight Cotton-Producing Southeastern States (Source: 1950 Census)*

Size of farms (Total acreage)	Gross income per farm[1]	Percentage of gross income required for cash operating expenses[2]	Net income per farm[2]
Less than 30 acres	$ 842	50	$ 421
30- 49 acres	1,301	55	585
50- 99 acres	1,564	60	626
100-179 acres	2,131	65	746
180-259 acres	3,050	70	915
260 acres and over	8,088	75	2,022
Average	$1,877	63	$ 695

[1] Average sales per farm reporting. [2] Estimated.
*Includes Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee.

harvest less than 25 acres, and 97 percent less than 50 acres. With cotton acreage restriction almost a certainty for next year, the acreage of cotton grown per farm will be even less than at present.

A number of recent studies on the economics of mechanical cotton pickers have indicated that for efficient and economic use of the larger machines, we need in this area about 100 acres of cotton. Only one percent of the cotton producers in this area have 100 acres or more of cotton. This one percent, however, represents a potential market for an estimated 13,000 units of the larger mechanical pickers now on the market. Some of the more recently developed cotton pickers, that are smaller in size, require smaller power units and are lower in cost, are adapted for economic use on a somewhat smaller minimum acreage than the larger machines. If this minimum for presently available "small" cotton pickers proves to be about 50 acres, then, in this area, we have more than 17,000 farms that have between 50 and 100 acres of cotton per farm, and which represent a potential market for an estimated 20,000 units of the presently available "small" cotton picker. This potential is also available to those mechanical cotton strippers which are economically feasible on units of this size. These groupings are based on 1950 Census data, and therefore do not take into account changes that have occurred during the past three years or the importance of multiple farm operating units. Nor do these data take into account the possibilities of cooperative or joint ownership and use of harvesting machinery, or of the use of custom harvesting. Such factors would greatly increase the potential use of cotton harvesting machinery in this area.

These data are cited to show both the amount of progress that has been made by industry in meeting the needs of farmers for cotton harvesting machinery, and to point up the importance of the problem that still remains to be solved. In this area, there is at present a tremendous potential market for the cotton harvesting machinery that has already been developed—both pickers and strippers. There is an even larger potential market for machines that are not yet on the market. If we had available on today's market a mechanical cotton picker that would operate economically on 25 acres of cotton, there would be a potential market in the Southeast for more than 70,000 units of this machine. The only cotton harvesting machines now available for economic use on units of 25 to 50 acres of cotton in this area are mechanical strippers. We do not yet have a mechanical picker that fits the needs of this tremendously large group of farmers. We are, however, moving in the right direction both in the development of machinery and equipment for use in this area, and in the order and rate of adoption of such equipment on farms in the area.

• **Mechanization in the Southeast**—In an area that is going through the process of mechanizing the production of its major row crops, farmers normally purchase their power units first, then purchase equipment in a rather definite order. Usually, the last operation to be mechanized will be that of harvesting the crop. This has been true in this area in the case of corn, peanuts, and now cotton. A recent study relative to cotton mechanization in the Southeast points

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out that over the past 15 to 20 years, the percentage of cotton land prepared with mechanical power has increased from 30 percent to 90 percent; the percentage of cotton cultivated with mechanical power has increased from 20 percent to 80 percent; and the percentage of cotton planted with mechanical power has increased from 20 percent to 60 percent. The substitution of mechanical power for animal power has made these gains possible.

During the past two decades, the number of tractors on farms in this area has increased at a tremendous rate. Half of the tractors now in this area are on farms of less than 100 acres. But because of the large number of small farms in the area, only about 10 percent of the farms with less than 50 acres have tractors; 22 percent of those with 50 to 100 acres have tractors. About 60 percent of those with more than 250 acres have tractors. These data refer to owner operated tractors only. They do not include the many additional farms, both large and small, that are obtaining the use of tractor power and equipment for certain operations under various tenure arrangements, by rental agreements, and through custom work.

Tractors and the types of equipment now on farms were largely responsible for this area's making its maximum contribution to increased farm output during the World War II and the early post-war years. Mechanization, although only partial, was the answer to labor shortages during this period.

Mechanization, coupled with better varieties, proper fertilization, better insect and disease control, and other improved practices, made its first big gain in this area during those years. In recent years, the gain has been even greater. But, despite the progress that has been made in farm mechanization, let us not forget that as recently as the year 1950, a total of 50 percent of the farms in this area were still being operated with workstock. Two-fifths of these were one-horse farms. Forty percent of the farms in the Southeast are part-time or residential farms; many of these are operated with workstock. Of the commercial farms in the area, many of these also are operated with workstock. But, in the main, commercial farmers that produce cotton as a major crop either own tractors or can obtain their use on a rental or custom basis for most production operations. Those cotton producing farms that are still operated with workstock are usually very small units and normally produce only a small share of the area's salable products. The number of such units is probably much smaller today than it was in 1950; in future years, the number will be even smaller. But we must remember that many of them are still here, and that some of them will continue to be here for many years to come. They should not and cannot be ignored if we are to serve the whole group of farmers in the area.

This area, a part of the Old Cotton South, was long a man-and-mule cotton producing area. Many of us today think of commercial farming as a kind of business that requires much more capital, better management, and more mechanical and technical skill than is available on most workstock-operated farms. Shifting from hand-and-mule operations to mechanically powered operations represents a drastic change. The Cotton South needs this type of change; it is gradually making the change; but to complete the transition will require a long period of time. This is as it should be. For, with this change must come changes in farm sizes, farm organizations, cropping systems, tenure arrangements, credit arrangements, pro-

Distribution of Farms by Size of Cotton Enterprise, Specified Areas, United States
(Source: 1950 Census)

Cotton acreage harvested per farm	Southeastern states [1]		Texas-Oklahoma area		Far Western area [2]	
	No. of farms	Percent of total	No. of farms	Percent of total	No. of farms	Percent of total
Less than 10 acres	440,648	50	34,321	18	1,846	14
10-24 acres	351,408	39	49,646	26	2,780	21
25-49 "	70,652	8	38,804	20	2,761	20
50-99 "	17,049	2	34,956	18	2,485	18
100 acres and over	8,665	1	33,602	18	3,598	27
Total	888,422	100	191,329	100	13,470	100

[1] Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. [2] Includes Arizona, California, and New Mexico.

Specified Data, by Size of Farms, 11 Southeastern States
(Source: 1950 Census)*

Size of farms (Total acreage)	Percentage of farms in each group	Percentage of farms reporting cotton harvested	Average acreage of cotton harvested per farm reporting	Percentage of farms reporting tractors on farm
Less than 30 acres	35	38	9	7
30- 49 acres	17	45	12	12
50- 99 acres	23	41	13	22
100-179 acres	14	35	17	35
180-259 acres	5	33	22	48
260 acres and over	6	30	61	62
Total or average	100	39	14	21

*Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

Specified Data, by Economic Classification, 11 Southeastern States
(Source: 1950 Census)

Economic classification	Percentage of farms in each group	Percentage of farms reporting cotton harvested	Average acreage of cotton harvested per farm reporting	Percentage of farms reporting tractors on farms
Commercial farms	60	56	16	27
Class I	1	34	264	80
Class II	2	33	78	79
Class III	4	42	32	64
Class IV	11	52	18	40
Class V	20	58	14	24
Class VI	22	60	9	11
Part-time	14	43	8	16
Residential	26	13	5	7
Abnormal	*	8	170	43
Total or average	100	39	14	21

*Less than one percent.

duction and marketing methods, social and institutional organizations, and a host of other factors.

• **Does Mechanization Pay?**—Results of recent research work by the U.S. Department of Agriculture, the state agricultural experiment stations, and the experiences of farmers themselves have demonstrated the technical feasibility of complete mechanization of cotton production and harvesting. (The one possible exception is that of weed control). These same sources indicate some of the limitations of the economic feasibility of complete mechanization. For large commercial farms, complete mechanization has been and can continue to be profitable. But, for the immediate future, the problem of maintaining the same margin of profit that has been possible in recent years will be difficult. A major factor affecting profits in 1954 will be the effects of acreage restriction on costs of production, particularly for those farmers who have machines that are now operating on a narrow margin or at the break-even point. Also affecting profitableness will be the continuing price-cost squeeze that cotton farmers, like most other farmers, are already experiencing. These two points in particular emphasize the importance of increased efficiency and lower costs of production in 1954 and future years.

Research results also indicate the extent to which smaller farms can mechanize their operations on a profitable basis. At least two different studies, for example, have shown that for general farms in this area consisting of about 30 acres of cropland and operated with family labor, workstock are a cheaper source of power than tractors. But, on these same farms, if family labor cannot handle most of the labor load, tractor power will normally be cheaper than workstock. Answering the question as to whether a tractor pays on a farm of any given size must be based on the conditions of that farm. Similarly, questions as to the economic feasibility of various sizes, types, and kinds of machinery and equipment must be answered in terms of individual farms. The one person best qualified to answer such questions, and the person who must make the final decision as to whether to use or not to use a given piece of equipment, is the farmer himself. This is a point we often overlook. The farmer, of course, needs all the assistance and guidance we can provide, but we should never attempt to "sell him short." Nor should we attempt to "oversell" him. The farmer largely controls his profits through the decisions he makes. As an operator of a private, independent business, this is as it should be. His individual success or failure is largely his own responsibility.

We have witnessed in the past two decades numerous and quite rapid developments in the cultural methods now available for producing and harvesting cotton. These new techniques are being adopted where feasible. Among the major factors serving to retard their full adoption in the Southeast are small-sized farms, limited capital, prevailing tenure systems, and lack of adaptability of some of these items to conditions in the area. These obstacles are being overcome; all of them can be overcome. The progress made to date is an indication, however, that it will take time, additional research, additional and more intensive educational efforts, additional capital, better farm management, and a real desire on the part of farmers to do the job that lies ahead.

• **Problems Are Opportunities** — In mechanizing cotton production and harvesting, our biggest problems are our biggest opportunities. Our greatest economies, lowest costs of production, and highest rates of efficiency thus far attained through complete mechanization have been on our larger units. As we move down the scale of farm sizes, these advantages become less evident. On very small units, they are often non-existent or are negative. Small units often can use mechanical power and certain items of machinery and equipment profitably. They cannot, with their present size and with the size and cost of machinery now available to them, economically purchase and/or utilize some of the machines and associated technologies necessary for complete mechanization. Cooperative or joint ownership and use offer some opportunities. Custom work offers additional opportunities. Neither of these, however, is a dependable solution.

Where small farms are partially mechanized, they usually differ in a number of respects from non-mechanized small farms. Among these differences, the partially mechanized small farms usually have the following:

1. A greater over-all productive capacity;
2. A higher over-all productive efficiency, although power and machinery efficiency may be lower;
3. A greater output per unit of labor;

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4. Somewhat lower requirements for labor;

5. Higher capital requirements and often higher operating costs; and

6. A better opportunity for increasing incomes and profits.

Operators of partially-mechanized small farms can better improve the quality of their field work and the timeliness of field operations. They have more flexibility in their organizational and operational procedures. They can expand their farm business. All of these call for increased managerial responsibilities.

To spread these kinds of benefits and advantages to larger numbers of our present small farms, however, we need to develop and perfect, in many cases, smaller, more flexible, and lower cost machinery and equipment. The farmer himself needs a larger operating unit, additional technical guidance and assistance (based on the results of scientific research), more adequate capital, and a number of associated social and institutional changes.

As workstock farms continue to change to tractor farms, and as partial mechanization becomes more nearly complete mechanization, a large part of the labor force now on farms in the Southeast will not be needed in commercial agriculture. The continually expanding industrial and business developments in the Southeast will continue to provide off-farm employment opportunities to many of those full time workers who are released from the farm labor force by mechanization and associated technological developments. Still others will find employment in other fields both in the Southeast and in other part of the country. Both those who remain on farms and those who leave the farms should benefit and profit from this type of adjustment.

But, with partial mechanization on small family operated farms, the labor force released is usually family labor. This poses a somewhat different kind of problem. For, if this labor becomes idle as a result of mechanizing certain farm operations, but is still needed on the farm for other operations that require seasonal hand labor, many of the advantages and benefits that should accrue from mechanization may not be realized. Circumstances such as these would indicate that some farmers would be better off not to mechanize. For those that do mechanize, however, it appears that their ultimate goal in mechanization should continue to be complete mechanization.

• **The Small Farm of the Future**—As we continue, by working together, to take advantage of our opportunities in solving our problems, through mechanization and other technological advancements, the small farm of the future will become a larger farm than the small farm of today. It will be more efficient; it will have lower costs of production, a higher productive capacity, a higher level of income, and an improved living standard. These gains will be shared by the entire economy of the area—agriculture, industry, and business — and their effects will be felt throughout the Cotton Belt and in the nation generally. We may yet see the day when the small family farms of the Southeast will again, in a highly competitive situation, offer the same healthy independence they formerly did —plus a steady, dependable income.

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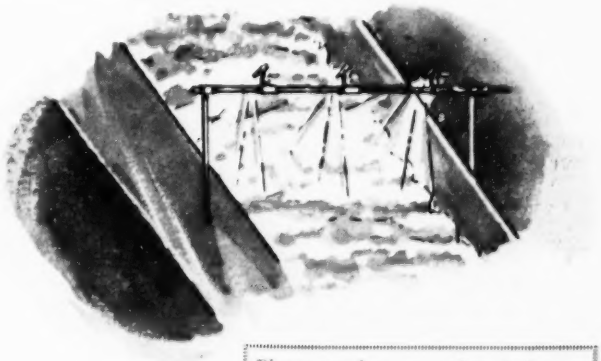

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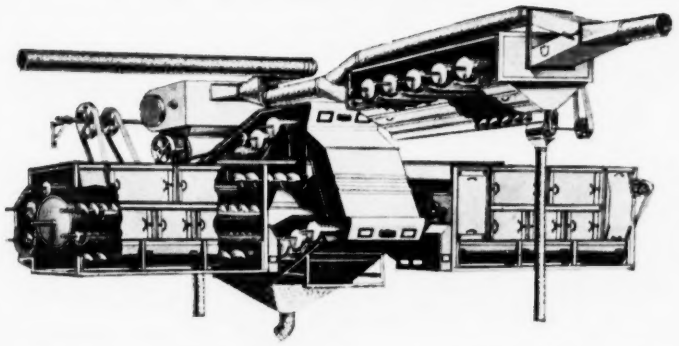

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